SEQUENCE LISTING

<110> Saus, Juan
Revert , Fernando
Revert-Ros, Francisco

<120> Novel Goodpasture antigen-binding protein isoforms and protein misfolded-mediated disorders

<130> 03-075-US

<150> US 60/445,043
<151> 2003-02-05

<150> US 60/445,003
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<170> PatentIn version 3.1

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gcagctgagg gagcgggggc cggtctcctg ctcggttgtc gagcctcc atg tcg gat 417
Met Ser Asp
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aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca gag acg gag 465
Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu
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Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn
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tac att cat ggg tgg cag gat cgt tgg gta gtt ttg aaa aat aat gct 561
Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Ala
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Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu
        70                  75                  80

tgt cga ttt gat att agt gta aat gat agt gtt tgg tat ctt cgt gct      705
Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala
    85                  90                  95

cag gat cca gat cat aga cag caa tgg ata gat gcc att gaa cag cac      753
Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln His
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aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt cga cat ggc      801
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tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct gca aca tcc      849
Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser
            135                 140                 145

acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag ttg gct gaa      897
Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu
        150                 155                 160

atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac acg cta cag      945
Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln
    165                 170                 175

aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat gaa ctt caa      993
Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu Gln
180                 185                 190                 195

agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct aca acg cgt     1041
Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg
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tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa gaa aag tta     1089
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            215                 220                 225

ttt cca cat gtg aca cca aaa gga att aat ggt ata gac ttt aaa ggg     1137
Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly
        230                 235                 240

gaa gcg ata act ttt aaa gca act act gct gga atc ctt gca aca ctt     1185
Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu
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tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc tgg cag aag     1233
Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln Lys
260                 265                 270                 275

aga ctg gat aag gaa act gag aag aaa aga aga aca gag gaa gca tat     1281
Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala Tyr
                280                 285                 290

aaa aat gca atg aca gaa ctt aag aaa aaa tcc cac ttt gga gga cca     1329
Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly Pro
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gat gct gtt gaa gct gct ctt gac aga caa gat aaa ata gaa gaa cag     1425
Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln
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tca cag agt gaa aag gtg aga tta cat tgg cct aca tcc ttg ccc tct     1473
Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro Ser
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gga gat gcc ttt tct tct gtg ggg aca cat aga ttt gtc caa aag ccc     1521
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tat agt cgc tct tcc tcc atg tct tcc att gat cta gtc agt gcc tct     1569
Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser Ala Ser
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gat gat gtt cac aga ttc agc tcc cag gtt gaa gag atg gtg cag aac     1617
Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met Val Gln Asn
        390                 395                 400

cac atg act tac tca tta cag gat gta ggc gga gat gcc aat tgg cag     1665
His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln
    405                 410                 415

ttg gtt gta gaa gaa gga gaa atg aag gta tac aga aga gaa gta gaa     1713
Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu
420                 425                 430                 435

gaa aat ggg att gtt ctg gat cct tta aaa gct acc cat gca gtt aaa     1761
Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys
                440                 445                 450

ggc gtc aca gga cat gaa gtc tgc aat tat ttc tgg aat gtt gac gtt     1809
Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val
            455                 460                 465

cgc aat gac tgg gaa aca act ata gaa aac ttt cat gtg gtg gaa aca     1857
Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr
        470                 475                 480

tta gct gat aat gca atc atc att tat caa aca cac aag agg gtg tgg     1905
Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp
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cct gct tct cag cga gac gta tta tat ctt tct gtc att cga aag ata     1953
Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile
500                 505                 510                 515

cca gcc ttg act gaa aat gac cct gaa act tgg ata gtt tgt aat ttt     2001
Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe
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tct gtg gat cat gac agt gct cct cta aac aac cga tgt gtc cgt gcc     2049
Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala
            535                 540                 545

aaa ata aat gtt gct atg att tgt caa acc ttg gta agc cca cca gag     2097
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        550                 555                 560

gga aac cag gaa att agc agg gac aac att cta tgc aag att aca tat     2145
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gta gct aat gtg aac cct gga gga tgg gca cca gcc tca gtg tta agg     2193
Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg
580                 585                 590                 595

gca gtg gca aag cga gag tat cct aaa ttt cta aaa cgt ttt act tct     2241
Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser
                600                 605                 610

tac gtc caa gaa aaa act gca gga aag cct att ttg ttc tag             2283
Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
            615                 620

tattaacagg tactagaaga tatgttttat ctttttttaa ctttatttga ctaatatgac   2343

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Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly
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Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp
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Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr
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Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile
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Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg
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Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser
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130 135 140

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Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp
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Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro
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Thr Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys
210 215 220

Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp
225 230 235 240

Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu
245 250 255

Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser
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Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu
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Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe
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Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu
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325 330 335

Glu Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser
340 345 350

Leu Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val
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Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val
370 375 380

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Ser Ala Ser Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met
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Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala
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Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg
            420                 425                 430

Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His
        435                 440                 445

Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn
    450                 455                 460

Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val
465                 470                 475                 480

Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys
                485                 490                 495

Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile
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Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val
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Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys
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Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser
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Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys
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Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser
            580                 585                 590

Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg
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tggaagggta ggcttccttc accgctcgtc ctccttcctc gctccgctcg gtgtcaggcg    240

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gcactcttcg cttcgccatc ccccgaccct tcaccccgag gactgggcgc ctcctccggc    360

gcagctgagg gagcgggggc cggtctcctg ctcggttgtc gagcctcc atg tcg gat     417
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aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca gag acg gag       465
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    5                  10                  15

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Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Ala
                40                  45                  50

ctg agt tac tac aaa tct gaa gat gaa aca gag tat ggc tgc aga gga       609
Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly
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tcc atc tgt ctt agc aag gct gtc atc aca cct cac gat ttt gat gaa       657
Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu
        70                  75                  80

tgt cga ttt gat att agt gta aat gat agt gtt tgg tat ctt cgt gct       705
Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala
    85                  90                  95

cag gat cca gat cat aga cag caa tgg ata gat gcc att gaa cag cac       753
Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln His
100                 105                 110                 115

aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt cga cat ggc       801
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                120                 125                 130

tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct gca aca tcc       849
Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser
            135                 140                 145

acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag ttg gct gaa       897
Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu
        150                 155                 160
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atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac acg cta cag      945
Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln
    165                 170                 175

aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat gaa ctt caa      993
Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu Gln
180                 185                 190                 195

agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct aca acg cgt     1041
Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg
                200                 205                 210

tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa gaa aag tta     1089
Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys Leu
            215                 220                 225

ttt cca cat gtg aca cca aaa gga att aat ggt ata gac ttt aaa ggg     1137
Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly
        230                 235                 240

gaa gcg ata act ttt aaa gca act act gct gga atc ctt gca aca ctt     1185
Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu
    245                 250                 255

tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc tgg cag aag     1233
Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln Lys
260                 265                 270                 275

aga ctg gat aag gaa act gag aag aaa aga aga aca gag gaa gca tat     1281
Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala Tyr
                280                 285                 290

aaa aat gca atg aca gaa ctt aag aaa aaa tcc cac ttt gga gga cca     1329
Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly Pro
            295                 300                 305

gat tat gaa gaa ggc cct aac agt ctg att aat gaa gaa gag ttc ttt     1377
Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe
        310                 315                 320

gat gct gtt gaa gct gct ctt gac aga caa gat aaa ata gaa gaa cag     1425
Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln
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tca cag agt gaa aag gtg aga tta cat tgg cct aca tcc ttg ccc tct     1473
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340                 345                 350                 355

gga gat gcc ttt tct tct gtg ggg aca cat aga ttt gtc caa aag gtt     1521
Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Val
                360                 365                 370

gaa gag atg gtg cag aac cac atg act tac tca tta cag gat gta ggc     1569
Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly
            375                 380                 385

gga gat gcc aat tgg cag ttg gtt gta gaa gaa gga gaa atg aag gta     1617
Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val
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tac aga aga gaa gta gaa gaa aat ggg att gtt ctg gat cct tta aaa     1665
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    405                 410                 415

gct acc cat gca gtt aaa ggc gtc aca gga cat gaa gtc tgc aat tat     1713
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420                 425                 430                 435

ttc tgg aat gtt gac gtt cgc aat gac tgg gaa aca act ata gaa aac     1761
Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn
                440                 445                 450

ttt cat gtg gtg gaa aca tta gct gat aat gca atc atc att tat caa     1809
Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln
            455                 460                 465

aca cac aag agg gtg tgg cct gct tct cag cga gac gta tta tat ctt     1857
Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu
        470                 475                 480

tct gtc att cga aag ata cca gcc ttg act gaa aat gac cct gaa act     1905
Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr
    485                 490                 495

tgg ata gtt tgt aat ttt tct gtg gat cat gac agt gct cct cta aac     1953
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                520                 525                 530

ttg gta agc cca cca gag gga aac cag gaa att agc agg gac aac att     2049
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            535                 540                 545

cta tgc aag att aca tat gta gct aat gtg aac cct gga gga tgg gca     2097
Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala
        550                 555                 560

cca gcc tca gtg tta agg gca gtg gca aag cga gag tat cct aaa ttt     2145
Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe
    565                 570                 575

cta aaa cgt ttt act tct tac gtc caa gaa aaa act gca gga aag cct     2193
Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro
580                 585                 590                 595

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Ile Leu Phe

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        35                  40                  45

Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly
    50                  55                  60

Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp
65                  70                  75                  80

Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr
                85                  90                  95

Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile
            100                 105                 110

Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg
        115                 120                 125

Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser
    130                 135                 140

Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys
145                 150                 155                 160

Leu Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp
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Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp
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Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro
        195                 200                 205

Thr Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys
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Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp
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Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu
                245                 250                 255
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Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser
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Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu
        275                 280                 285

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    290                 295                 300

Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu
305                 310                 315                 320

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                325                 330                 335

Glu Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser
            340                 345                 350

Leu Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val
        355                 360                 365

Gln Lys Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln
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Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
385                 390                 395                 400

Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
                405                 410                 415

Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
            420                 425                 430

Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr
        435                 440                 445

Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
    450                 455                 460

Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
465                 470                 475                 480

Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp
                485                 490                 495

Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala
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Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile
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Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg
    530                 535                 540

Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
545                 550                 555                 560

Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
                565                 570                 575

Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala
            580                 585                 590

Gly Lys Pro Ile Leu Phe
        595
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tctcttccct tcttttccct tttccttccc tatttgaaa ttg gca tcg agg ggg       114
                                        Leu Ala Ser Arg Gly
                                        1               5

cta agt tcg ggt ggc agc gcc ggg cgc aac gca ggg gtc acg gcg acg      162
Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala Gly Val Thr Ala Thr
                10                  15                  20

gcg gcg gcg gct gac ggc tgg aag ggt agg ctt cct tca ccg ctc gtc      210
Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Val
            25                  30                  35

ctc ctt cct cgc tcc gct cgg tgt cag gcg cgg cgg cgg cgc ggc ggg      258
Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly
        40                  45                  50

cgg act tcg tcc ctc ctc ctg ctc ccc ccc aca ccg gag cgg gca ctc      306
Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro Glu Arg Ala Leu
    55                  60                  65

ttc gct tcg cca tcc ccc gac cct tca ccc cga gga ctg ggc gcc tcc      354
Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser
70                  75                  80                  85

tcc ggc gca gct gag gga gcg ggg gcc ggt ctc ctg ctc ggt tgt cga      402
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Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg
                90                  95                  100

gcc tcc atg tcg gat aat cag agc tgg aac tcg tcg ggc tcg gag gag      450
Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu
            105                 110                 115

gat cca gag acg gag tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc      498
Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu
        120                 125                 130

agt aag tgg aca aac tac att cat ggg tgg cag gat cgt tgg gta gtt      546
Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val
    135                 140                 145

ttg aaa aat aat gct ctg agt tac tac aaa tct gaa gat gaa aca gag      594
Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu
150                 155                 160                 165

tat ggc tgc aga gga tcc atc tgt ctt agc aag gct gtc atc aca cct      642
Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro
                170                 175                 180

cac gat ttt gat gaa tgt cga ttt gat att agt gta aat gat agt gtt      690
His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val
            185                 190                 195

tgg tat ctt cgt gct cag gat cca gat cat aga cag caa tgg ata gat      738
Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp
        200                 205                 210

gcc att gaa cag cac aag act gaa tct gga tat gga tct gaa tcc agc      786
Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser
    215                 220                 225

ttg cgt cga cat ggc tca atg gtg tcc ctg gtg tct gga gca agt ggc      834
Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly
230                 235                 240                 245

tac tct gca aca tcc acc tct tca ttc aag aaa ggc cac agt tta cgt      882
Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg
                250                 255                 260

gag aag ttg gct gaa atg gaa aca ttt aga gac atc tta tgt aga caa      930
Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln
            265                 270                 275

gtt gac acg cta cag aag tac ttt gat gcc tgt gct gat gct gtc tct      978
Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser
        280                 285                 290

aag gat gaa ctt caa agg gat aaa gtg gta gaa gat gat gaa gat gac     1026
Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp
    295                 300                 305

ttt cct aca acg cgt tct gat ggt gac ttc ttg cat agt acc aac ggc     1074
Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly
310                 315                 320                 325

aat aaa gaa aag tta ttt cca cat gtg aca cca aaa gga att aat ggt     1122
Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly
                330                 335                 340
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ata gac ttt aaa ggg gaa gcg ata act ttt aaa gca act act gct gga    1170
Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly
            345                 350                 355

atc ctt gca aca ctt tct cat tgt att gaa cta atg gtt aaa cgt gag    1218
Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu
        360                 365                 370

gac agc tgg cag aag aga ctg gat aag gaa act gag aag aaa aga aga    1266
Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg
    375                 380                 385

aca gag gaa gca tat aaa aat gca atg aca gaa ctt aag aaa aaa tcc    1314
Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser
390                 395                 400                 405

cac ttt gga gga cca gat tat gaa gaa ggc cct aac agt ctg att aat    1362
His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn
                410                 415                 420

gaa gaa gag ttc ttt gat gct gtt gaa gct gct ctt gac aga caa gat    1410
Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp
            425                 430                 435

aaa ata gaa gaa cag tca cag agt gaa aag gtg aga tta cat tgg cct    1458
Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro
        440                 445                 450

aca tcc ttg ccc tct gga gat gcc ttt tct tct gtg ggg aca cat aga    1506
Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg
    455                 460                 465

ttt gtc caa aag ccc tat agt cgc tct tcc tcc atg tct tcc att gat    1554
Phe Val Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp
470                 475                 480                 485

cta gtc agt gcc tct gat gat gtt cac aga ttc agc tcc cag gtt gaa    1602
Leu Val Ser Ala Ser Asp Asp Val His Arg Phe Ser Ser Gln Val Glu
                490                 495                 500

gag atg gtg cag aac cac atg act tac tca tta cag gat gta ggc gga    1650
Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly
            505                 510                 515

gat gcc aat tgg cag ttg gtt gta gaa gaa gga gaa atg aag gta tac    1698
Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr
        520                 525                 530

aga aga gaa gta gaa gaa aat ggg att gtt ctg gat cct tta aaa gct    1746
Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala
    535                 540                 545

acc cat gca gtt aaa ggc gtc aca gga cat gaa gtc tgc aat tat ttc    1794
Thr His Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe
550                 555                 560                 565

tgg aat gtt gac gtt cgc aat gac tgg gaa aca act ata gaa aac ttt    1842
Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe
                570                 575                 580

cat gtg gtg gaa aca tta gct gat aat gca atc atc att tat caa aca    1890
His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr
            585                 590                 595
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cac aag agg gtg tgg cct gct tct cag cga gac gta tta tat ctt tct     1938
His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser
        600                 605                 610

gtc att cga aag ata cca gcc ttg act gaa aat gac cct gaa act tgg     1986
Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp
    615                 620                 625

ata gtt tgt aat ttt tct gtg gat cat gac agt gct cct cta aac aac     2034
Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn
630                 635                 640                 645

cga tgt gtc cgt gcc aaa ata aat gtt gct atg att tgt caa acc ttg     2082
Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu
                650                 655                 660

gta agc cca cca gag gga aac cag gaa att agc agg gac aac att cta     2130
Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu
            665                 670                 675

tgc aag att aca tat gta gct aat gtg aac cct gga gga tgg gca cca     2178
Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro
        680                 685                 690

gcc tca gtg tta agg gca gtg gca aag cga gag tat cct aaa ttt cta     2226
Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu
    695                 700                 705

aaa cgt ttt act tct tac gtc caa gaa aaa act gca gga aag cct att     2274
Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile
710                 715                 720                 725

ttg ttc tag tattaacagg tactagaaga tatgttttat ctttttttaa             2323
Leu Phe


ctttatttga ctaatatgac tgtcaatact aaaatttagt tgttgaaagt atttactatg   2383

tttttt                                                              2389


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1               5                   10                  15


Gly Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu
            20                  25                  30


Pro Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg
        35                  40                  45


Arg Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr
    50                  55                  60
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Pro Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg
65                  70                  75                  80

Gly Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu
                85                  90                  95

Leu Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser
            100                 105                 110

Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu
        115                 120                 125

Arg Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln
    130                 135                 140

Asp Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser
145                 150                 155                 160

Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys
                165                 170                 175

Ala Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser
            180                 185                 190

Val Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg
        195                 200                 205

Gln Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr
    210                 215                 220

Gly Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val
225                 230                 235                 240

Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys
                245                 250                 255

Gly His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp
            260                 265                 270

Ile Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys
        275                 280                 285

Ala Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu
    290                 295                 300

Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu
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305 310 315 320

His Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro
325 330 335

Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys
340 345 350

Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu
355 360 365

Met Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr
370 375 380

Glu Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu
385 390 395 400

Leu Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro
405 410 415

Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala
420 425 430

Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val
435 440 445

Arg Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser
450 455 460

Val Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser Arg Ser Ser Ser
465 470 475 480

Met Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Asp Val His Arg Phe
485 490 495

Ser Ser Gln Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu
500 505 510

Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly
515 520 525

Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu
530 535 540

Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu
545 550 555 560

Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr
565 570 575

Thr Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile
580 585 590

Ile Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp
595 600 605

Val Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn
610 615 620

Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser
625 630 635 640

Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met
645 650 655

Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser
660 665 670

Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro
675 680 685

Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu
690 695 700

Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr
705 710 715 720

Ala Gly Lys Pro Ile Leu Phe
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Leu Ala Ser Arg Gly
1 5

cta agt tcg ggt ggc agc gcc ggg cgc aac gca ggg gtc acg gcg acg 162
Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala Gly Val Thr Ala Thr

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                10                  15                  20

gcg gcg gcg gct gac ggc tgg aag ggt agg ctt cct tca ccg ctc gtc      210
Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Val
            25                  30                  35

ctc ctt cct cgc tcc gct cgg tgt cag gcg cgg cgg cgg cgc ggc ggg      258
Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly
        40                  45                  50

cgg act tcg tcc ctc ctc ctg ctc ccc ccc aca ccg gag cgg gca ctc      306
Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro Glu Arg Ala Leu
    55                  60                  65

ttc gct tcg cca tcc ccc gac cct tca ccc cga gga ctg ggc gcc tcc      354
Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser
70                  75                  80                  85

tcc ggc gca gct gag gga gcg ggg gcc ggt ctc ctg ctc ggt tgt cga      402
Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg
                90                  95                  100

gcc tcc atg tcg gat aat cag agc tgg aac tcg tcg ggc tcg gag gag      450
Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu
            105                 110                 115

gat cca gag acg gag tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc      498
Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu
        120                 125                 130

agt aag tgg aca aac tac att cat ggg tgg cag gat cgt tgg gta gtt      546
Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val
    135                 140                 145

ttg aaa aat aat gct ctg agt tac tac aaa tct gaa gat gaa aca gag      594
Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu
150                 155                 160                 165

tat ggc tgc aga gga tcc atc tgt ctt agc aag gct gtc atc aca cct      642
Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro
                170                 175                 180

cac gat ttt gat gaa tgt cga ttt gat att agt gta aat gat agt gtt      690
His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val
            185                 190                 195

tgg tat ctt cgt gct cag gat cca gat cat aga cag caa tgg ata gat      738
Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp
        200                 205                 210

gcc att gaa cag cac aag act gaa tct gga tat gga tct gaa tcc agc      786
Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser
    215                 220                 225

ttg cgt cga cat ggc tca atg gtg tcc ctg gtg tct gga gca agt ggc      834
Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly
230                 235                 240                 245

tac tct gca aca tcc acc tct tca ttc aag aaa ggc cac agt tta cgt      882
Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg
                250                 255                 260

gag aag ttg gct gaa atg gaa aca ttt aga gac atc tta tgt aga caa      930
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Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln
            265                 270                 275

gtt gac acg cta cag aag tac ttt gat gcc tgt gct gat gct gtc tct      978
Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser
        280                 285                 290

aag gat gaa ctt caa agg gat aaa gtg gta gaa gat gat gaa gat gac     1026
Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp
    295                 300                 305

ttt cct aca acg cgt tct gat ggt gac ttc ttg cat agt acc aac ggc     1074
Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly
310                 315                 320                 325

aat aaa gaa aag tta ttt cca cat gtg aca cca aaa gga att aat ggt     1122
Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly
                330                 335                 340

ata gac ttt aaa ggg gaa gcg ata act ttt aaa gca act act gct gga     1170
Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly
            345                 350                 355

atc ctt gca aca ctt tct cat tgt att gaa cta atg gtt aaa cgt gag     1218
Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu
        360                 365                 370

gac agc tgg cag aag aga ctg gat aag gaa act gag aag aaa aga aga     1266
Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg
    375                 380                 385

aca gag gaa gca tat aaa aat gca atg aca gaa ctt aag aaa aaa tcc     1314
Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser
390                 395                 400                 405

cac ttt gga gga cca gat tat gaa gaa ggc cct aac agt ctg att aat     1362
His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn
                410                 415                 420

gaa gaa gag ttc ttt gat gct gtt gaa gct gct ctt gac aga caa gat     1410
Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp
            425                 430                 435

aaa ata gaa gaa cag tca cag agt gaa aag gtg aga tta cat tgg cct     1458
Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro
        440                 445                 450

aca tcc ttg ccc tct gga gat gcc ttt tct tct gtg ggg aca cat aga     1506
Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg
    455                 460                 465

ttt gtc caa aag gtt gaa gag atg gtg cag aac cac atg act tac tca     1554
Phe Val Gln Lys Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser
470                 475                 480                 485

tta cag gat gta ggc gga gat gcc aat tgg cag ttg gtt gta gaa gaa     1602
Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu
                490                 495                 500

gga gaa atg aag gta tac aga aga gaa gta gaa gaa aat ggg att gtt     1650
Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val
            505                 510                 515
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ctg gat cct tta aaa gct acc cat gca gtt aaa ggc gtc aca gga cat     1698
Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His
        520                 525                 530

gaa gtc tgc aat tat ttc tgg aat gtt gac gtt cgc aat gac tgg gaa     1746
Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu
    535                 540                 545

aca act ata gaa aac ttt cat gtg gtg gaa aca tta gct gat aat gca     1794
Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala
550                 555                 560                 565

atc atc att tat caa aca cac aag agg gtg tgg cct gct tct cag cga     1842
Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg
                570                 575                 580

gac gta tta tat ctt tct gtc att cga aag ata cca gcc ttg act gaa     1890
Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu
            585                 590                 595

aat gac cct gaa act tgg ata gtt tgt aat ttt tct gtg gat cat gac     1938
Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp
        600                 605                 610

agt gct cct cta aac aac cga tgt gtc cgt gcc aaa ata aat gtt gct     1986
Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala
    615                 620                 625

atg att tgt caa acc ttg gta agc cca cca gag gga aac cag gaa att     2034
Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile
630                 635                 640                 645

agc agg gac aac att cta tgc aag att aca tat gta gct aat gtg aac     2082
Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn
                650                 655                 660

cct gga gga tgg gca cca gcc tca gtg tta agg gca gtg gca aag cga     2130
Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg
            665                 670                 675

gag tat cct aaa ttt cta aaa cgt ttt act tct tac gtc caa gaa aaa     2178
Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys
        680                 685                 690

act gca gga aag cct att ttg ttc tag tattaacagg tactagaaga           2225
Thr Ala Gly Lys Pro Ile Leu Phe
    695                 700

tatgttttat ctttttttaa ctttatttga ctaatatgac tgtcaatact aaaatttagt   2285

tgttgaaagt atttactatg tttttt                                       2311
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<212> PRT
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<400> 8

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Leu Ala Ser Arg Gly Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala
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Gly Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu
20 25 30

Pro Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg
35 40 45

Arg Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr
50 55 60

Pro Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg
65 70 75 80

Gly Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu
85 90 95

Leu Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser
100 105 110

Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu
115 120 125

Arg Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln
130 135 140

Asp Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser
145 150 155 160

Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys
165 170 175

Ala Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser
180 185 190

Val Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg
195 200 205

Gln Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr
210 215 220

Gly Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val
225 230 235 240

Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys
245 250 255

Gly His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp
260 265 270

```
Ile Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys
        275                 280                 285

Ala Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu
    290                 295                 300

Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu
305                 310                 315                 320

His Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro
                325                 330                 335

Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys
            340                 345                 350

Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu
        355                 360                 365

Met Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr
    370                 375                 380

Glu Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu
385                 390                 395                 400

Leu Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro
                405                 410                 415

Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala
            420                 425                 430

Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val
        435                 440                 445

Arg Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser
    450                 455                 460

Val Gly Thr His Arg Phe Val Gln Lys Val Glu Glu Met Val Gln Asn
465                 470                 475                 480

His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln
                485                 490                 495

Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu
            500                 505                 510

Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys
```

515 520 525

Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val
530 535 540

Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr
545 550 555 560

Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp
565 570 575

Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile
580 585 590

Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe
595 600 605

Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala
610 615 620

Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu
625 630 635 640

Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr
645 650 655

Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg
660 665 670

Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser
675 680 685

Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
690 695 700

<210> 9
<211> 1914
<212> DNA
<213> Artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(1914)
<223>

<400> 9
gga gcg ggg gcc ggt ctc ctg ctc ggt tgt cga gcc tcc atg tcg gat 48
Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser Asp

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1               5                  10                  15

aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca gag acg gag      96
Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu
            20                  25                  30

tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc agt aag tgg aca aac     144
Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn
        35                  40                  45

tac att cat ggg tgg cag gat cgt tgg gta gtt ttg aaa aat aat gct     192
Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Ala
    50                  55                  60

ctg agt tac tac aaa tct gaa gat gaa aca gag tat ggc tgc aga gga     240
Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly
65                  70                  75                  80

tcc atc tgt ctt agc aag gct gtc atc aca cct cac gat ttt gat gaa     288
Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu
                85                  90                  95

tgt cga ttt gat att agt gta aat gat agt gtt tgg tat ctt cgt gct     336
Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala
            100                 105                 110

cag gat cca gat cat aga cag caa tgg ata gat gcc att gaa cag cac     384
Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln His
        115                 120                 125

aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt cga cat ggc     432
Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His Gly
    130                 135                 140

tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct gca aca tcc     480
Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser
145                 150                 155                 160

acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag ttg gct gaa     528
Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu
                165                 170                 175

atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac acg cta cag     576
Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln
            180                 185                 190

aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat gaa ctt caa     624
Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu Gln
        195                 200                 205

agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct aca acg cgt     672
Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg
    210                 215                 220

tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa gaa aag tta     720
Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys Leu
225                 230                 235                 240

ttt cca cat gtg aca cca aaa gga att aat ggt ata gac ttt aaa ggg     768
Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly
                245                 250                 255

gaa gcg ata act ttt aaa gca act act gct gga atc ctt gca aca ctt     816
```

```
Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu
            260                 265                 270

tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc tgg cag aag      864
Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln Lys
        275                 280                 285

aga ctg gat aag gaa act gag aag aaa aga aga aca gag gaa gca tat      912
Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala Tyr
    290                 295                 300

aaa aat gca atg aca gaa ctt aag aaa aaa tcc cac ttt gga gga cca      960
Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly Pro
305                 310                 315                 320

gat tat gaa gaa ggc cct aac agt ctg att aat gaa gaa gag ttc ttt     1008
Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe
                325                 330                 335

gat gct gtt gaa gct gct ctt gac aga caa gat aaa ata gaa gaa cag     1056
Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln
            340                 345                 350

tca cag agt gaa aag gtg aga tta cat tgg cct aca tcc ttg ccc tct     1104
Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro Ser
        355                 360                 365

gga gat gcc ttt tct tct gtg ggg aca cat aga ttt gtc caa aag ccc     1152
Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Pro
    370                 375                 380

tat agt cgc tct tcc tcc atg tct tcc att gat cta gtc agt gcc tct     1200
Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser Ala Ser
385                 390                 395                 400

gat gat gtt cac aga ttc agc tcc cag gtt gaa gag atg gtg cag aac     1248
Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met Val Gln Asn
                405                 410                 415

cac atg act tac tca tta cag gat gta ggc gga gat gcc aat tgg cag     1296
His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln
            420                 425                 430

ttg gtt gta gaa gaa gga gaa atg aag gta tac aga aga gaa gta gaa     1344
Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu
        435                 440                 445

gaa aat ggg att gtt ctg gat cct tta aaa gct acc cat gca gtt aaa     1392
Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys
    450                 455                 460

ggc gtc aca gga cat gaa gtc tgc aat tat ttc tgg aat gtt gac gtt     1440
Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val
465                 470                 475                 480

cgc aat gac tgg gaa aca act ata gaa aac ttt cat gtg gtg gaa aca     1488
Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr
                485                 490                 495

tta gct gat aat gca atc atc att tat caa aca cac aag agg gtg tgg     1536
Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp
            500                 505                 510
```

```
cct gct tct cag cga gac gta tta tat ctt tct gtc att cga aag ata     1584
Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile
        515                 520                 525

cca gcc ttg act gaa aat gac cct gaa act tgg ata gtt tgt aat ttt     1632
Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe
    530                 535                 540

tct gtg gat cat gac agt gct cct cta aac aac cga tgt gtc cgt gcc     1680
Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala
545                 550                 555                 560

aaa ata aat gtt gct atg att tgt caa acc ttg gta agc cca cca gag     1728
Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu
                565                 570                 575

gga aac cag gaa att agc agg gac aac att cta tgc aag att aca tat     1776
Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr
            580                 585                 590

gta gct aat gtg aac cct gga gga tgg gca cca gcc tca gtg tta agg     1824
Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg
        595                 600                 605

gca gtg gca aag cga gag tat cct aaa ttt cta aaa cgt ttt act tct     1872
Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser
    610                 615                 620

tac gtc caa gaa aaa act gca gga aag cct att ttg ttc tag             1914
Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
625                 630                 635
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<210> 10
<211> 637
<212> PRT
<213> Artificial

<220>
<223> Derived sequence

<400> 10

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Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser Asp
1               5                   10                  15

Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu
            20                  25                  30

Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn
        35                  40                  45

Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Ala
    50                  55                  60

Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly
65                  70                  75                  80
```

```
Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu
                85                  90                  95

Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala
            100                 105                 110

Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln His
        115                 120                 125

Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His Gly
    130                 135                 140

Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser
145                 150                 155                 160

Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu
                165                 170                 175

Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln
            180                 185                 190

Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu Gln
        195                 200                 205

Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg
    210                 215                 220

Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys Leu
225                 230                 235                 240

Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly
                245                 250                 255

Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu
            260                 265                 270

Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln Lys
        275                 280                 285

Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala Tyr
    290                 295                 300

Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly Pro
305                 310                 315                 320

Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe
                325                 330                 335
```

```
Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln
            340                 345                 350

Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro Ser
        355                 360                 365

Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Pro
    370                 375                 380

Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser Ala Ser
385                 390                 395                 400

Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met Val Gln Asn
                405                 410                 415

His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln
            420                 425                 430

Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu
        435                 440                 445

Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys
    450                 455                 460

Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val
465                 470                 475                 480

Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr
                485                 490                 495

Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp
            500                 505                 510

Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile
        515                 520                 525

Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe
    530                 535                 540

Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala
545                 550                 555                 560

Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu
                565                 570                 575

Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr
            580                 585                 590
```

```
Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg
        595                 600                 605

Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser
    610                 615                 620

Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
625                 630                 635
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<210> 11
<211> 1836
<212> DNA
<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(1836)
<223>

<400> 11

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gga gcg ggg gcc ggt ctc ctg ctc ggt tgt cga gcc tcc atg tcg gat       48
Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser Asp
1               5                   10                  15

aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca gag acg gag       96
Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu
            20                  25                  30

tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc agt aag tgg aca aac      144
Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn
        35                  40                  45

tac att cat ggg tgg cag gat cgt tgg gta gtt ttg aaa aat aat gct      192
Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Ala
    50                  55                  60

ctg agt tac tac aaa tct gaa gat gaa aca gag tat ggc tgc aga gga      240
Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly
65                  70                  75                  80

tcc atc tgt ctt agc aag gct gtc atc aca cct cac gat ttt gat gaa      288
Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu
                85                  90                  95

tgt cga ttt gat att agt gta aat gat agt gtt tgg tat ctt cgt gct      336
Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala
            100                 105                 110

cag gat cca gat cat aga cag caa tgg ata gat gcc att gaa cag cac      384
Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln His
        115                 120                 125

aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt cga cat ggc      432
Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His Gly
    130                 135                 140
```

```
tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct gca aca tcc      480
Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser
145                 150                 155                 160

acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag ttg gct gaa      528
Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu
                165                 170                 175

atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac acg cta cag      576
Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln
            180                 185                 190

aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat gaa ctt caa      624
Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu Gln
        195                 200                 205

agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct aca acg cgt      672
Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg
    210                 215                 220

tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa gaa aag tta      720
Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys Leu
225                 230                 235                 240

ttt cca cat gtg aca cca aaa gga att aat ggt ata gac ttt aaa ggg      768
Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly
                245                 250                 255

gaa gcg ata act ttt aaa gca act act gct gga atc ctt gca aca ctt      816
Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu
            260                 265                 270

tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc tgg cag aag      864
Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln Lys
        275                 280                 285

aga ctg gat aag gaa act gag aag aaa aga aga aca gag gaa gca tat      912
Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala Tyr
    290                 295                 300

aaa aat gca atg aca gaa ctt aag aaa aaa tcc cac ttt gga gga cca      960
Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly Pro
305                 310                 315                 320

gat tat gaa gaa ggc cct aac agt ctg att aat gaa gaa gag ttc ttt     1008
Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe
                325                 330                 335

gat gct gtt gaa gct gct ctt gac aga caa gat aaa ata gaa gaa cag     1056
Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln
            340                 345                 350

tca cag agt gaa aag gtg aga tta cat tgg cct aca tcc ttg ccc tct     1104
Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro Ser
        355                 360                 365

gga gat gcc ttt tct tct gtg ggg aca cat aga ttt gtc caa aag gtt     1152
Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Val
    370                 375                 380

gaa gag atg gtg cag aac cac atg act tac tca tta cag gat gta ggc     1200
Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly
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385 390 395 400

gga gat gcc aat tgg cag ttg gtt gta gaa gaa gga gaa atg aag gta 1248
Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val
405 410 415

tac aga aga gaa gta gaa gaa aat ggg att gtt ctg gat cct tta aaa 1296
Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys
420 425 430

gct acc cat gca gtt aaa ggc gtc aca gga cat gaa gtc tgc aat tat 1344
Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr
435 440 445

ttc tgg aat gtt gac gtt cgc aat gac tgg gaa aca act ata gaa aac 1392
Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn
450 455 460

ttt cat gtg gtg gaa aca tta gct gat aat gca atc atc att tat caa 1440
Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln
465 470 475 480

aca cac aag agg gtg tgg cct gct tct cag cga gac gta tta tat ctt 1488
Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu
485 490 495

tct gtc att cga aag ata cca gcc ttg act gaa aat gac cct gaa act 1536
Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr
500 505 510

tgg ata gtt tgt aat ttt tct gtg gat cat gac agt gct cct cta aac 1584
Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn
515 520 525

aac cga tgt gtc cgt gcc aaa ata aat gtt gct atg att tgt caa acc 1632
Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr
530 535 540

ttg gta agc cca cca gag gga aac cag gaa att agc agg gac aac att 1680
Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile
545 550 555 560

cta tgc aag att aca tat gta gct aat gtg aac cct gga gga tgg gca 1728
Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala
565 570 575

cca gcc tca gtg tta agg gca gtg gca aag cga gag tat cct aaa ttt 1776
Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe
580 585 590

cta aaa cgt ttt act tct tac gtc caa gaa aaa act gca gga aag cct 1824
Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro
595 600 605

att ttg ttc tag 1836
Ile Leu Phe
610

<210> 12
<211> 611
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 12

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Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser Asp
1               5                  10                  15

Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu
            20                  25                  30

Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn
        35                  40                  45

Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Ala
    50                  55                  60

Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly
65                  70                  75                  80

Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu
                85                  90                  95

Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala
            100                 105                 110

Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln His
        115                 120                 125

Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His Gly
    130                 135                 140

Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser
145                 150                 155                 160

Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu
                165                 170                 175

Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln
            180                 185                 190

Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu Gln
        195                 200                 205

Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg
    210                 215                 220

Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys Leu
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225 230 235 240

Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly
245 250 255

Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu
260 265 270

Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln Lys
275 280 285

Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala Tyr
290 295 300

Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly Pro
305 310 315 320

Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe
325 330 335

Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln
340 345 350

Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro Ser
355 360 365

Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Val
370 375 380

Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly
385 390 395 400

Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val
405 410 415

Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys
420 425 430

Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr
435 440 445

Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn
450 455 460

Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln
465 470 475 480

```
Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu
                485                 490                 495

Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr
            500                 505                 510

Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn
        515                 520                 525

Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr
    530                 535                 540

Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile
545                 550                 555                 560

Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala
                565                 570                 575

Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe
            580                 585                 590

Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro
        595                 600                 605

Ile Leu Phe
    610
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<210> 13
<211> 1968
<212> DNA
<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(1968)
<223>

<400> 13

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cca tcc ccc gac cct tca ccc cga gga ctg ggc gcc tcc tcc ggc gca       48
Pro Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala
1               5                   10                  15

gct gag gga gcg ggg gcc ggt ctc ctg ctc ggt tgt cga gcc tcc atg       96
Ala Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met
            20                  25                  30

tcg gat aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca gag      144
Ser Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu
        35                  40                  45

acg gag tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc agt aag tgg      192
```

```
Thr Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp
    50                  55                  60

aca aac tac att cat ggg tgg cag gat cgt tgg gta gtt ttg aaa aat      240
Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn
65                  70                  75                  80

aat gct ctg agt tac tac aaa tct gaa gat gaa aca gag tat ggc tgc      288
Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys
                85                  90                  95

aga gga tcc atc tgt ctt agc aag gct gtc atc aca cct cac gat ttt      336
Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe
            100                 105                 110

gat gaa tgt cga ttt gat att agt gta aat gat agt gtt tgg tat ctt      384
Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu
        115                 120                 125

cgt gct cag gat cca gat cat aga cag caa tgg ata gat gcc att gaa      432
Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu
    130                 135                 140

cag cac aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt cga      480
Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg
145                 150                 155                 160

cat ggc tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct gca      528
His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala
                165                 170                 175

aca tcc acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag ttg      576
Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu
            180                 185                 190

gct gaa atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac acg      624
Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr
        195                 200                 205

cta cag aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat gaa      672
Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu
    210                 215                 220

ctt caa agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct aca      720
Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr
225                 230                 235                 240

acg cgt tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa gaa      768
Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu
                245                 250                 255

aag tta ttt cca cat gtg aca cca aaa gga att aat ggt ata gac ttt      816
Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe
            260                 265                 270

aaa ggg gaa gcg ata act ttt aaa gca act act gct gga atc ctt gca      864
Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala
        275                 280                 285

aca ctt tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc tgg      912
Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp
    290                 295                 300
```

```
cag aag aga ctg gat aag gaa act gag aag aaa aga aga aca gag gaa      960
Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu
305                 310                 315                 320

gca tat aaa aat gca atg aca gaa ctt aag aaa aaa tcc cac ttt gga     1008
Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly
                325                 330                 335

gga cca gat tat gaa gaa ggc cct aac agt ctg att aat gaa gaa gag     1056
Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu
            340                 345                 350

ttc ttt gat gct gtt gaa gct gct ctt gac aga caa gat aaa ata gaa     1104
Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu
        355                 360                 365

gaa cag tca cag agt gaa aag gtg aga tta cat tgg cct aca tcc ttg     1152
Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu
    370                 375                 380

ccc tct gga gat gcc ttt tct tct gtg ggg aca cat aga ttt gtc caa     1200
Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln
385                 390                 395                 400

aag ccc tat agt cgc tct tcc tcc atg tct tcc att gat cta gtc agt     1248
Lys Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser
                405                 410                 415

gcc tct gat gat gtt cac aga ttc agc tcc cag gtt gaa gag atg gtg     1296
Ala Ser Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met Val
            420                 425                 430

cag aac cac atg act tac tca tta cag gat gta ggc gga gat gcc aat     1344
Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn
        435                 440                 445

tgg cag ttg gtt gta gaa gaa gga gaa atg aag gta tac aga aga gaa     1392
Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu
    450                 455                 460

gta gaa gaa aat ggg att gtt ctg gat cct tta aaa gct acc cat gca     1440
Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala
465                 470                 475                 480

gtt aaa ggc gtc aca gga cat gaa gtc tgc aat tat ttc tgg aat gtt     1488
Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val
                485                 490                 495

gac gtt cgc aat gac tgg gaa aca act ata gaa aac ttt cat gtg gtg     1536
Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val
            500                 505                 510

gaa aca tta gct gat aat gca atc atc att tat caa aca cac aag agg     1584
Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg
        515                 520                 525

gtg tgg cct gct tct cag cga gac gta tta tat ctt tct gtc att cga     1632
Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg
    530                 535                 540

aag ata cca gcc ttg act gaa aat gac cct gaa act tgg ata gtt tgt     1680
Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys
545                 550                 555                 560
```

```
aat ttt tct gtg gat cat gac agt gct cct cta aac aac cga tgt gtc     1728
Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val
                565                 570                 575

cgt gcc aaa ata aat gtt gct atg att tgt caa acc ttg gta agc cca     1776
Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro
            580                 585                 590

cca gag gga aac cag gaa att agc agg gac aac att cta tgc aag att     1824
Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile
        595                 600                 605

aca tat gta gct aat gtg aac cct gga gga tgg gca cca gcc tca gtg     1872
Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val
    610                 615                 620

tta agg gca gtg gca aag cga gag tat cct aaa ttt cta aaa cgt ttt     1920
Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe
625                 630                 635                 640

act tct tac gtc caa gaa aaa act gca gga aag cct att ttg ttc tag     1968
Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
                645                 650                 655
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<210> 14
<211> 655
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 14

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Pro Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala
1               5                   10                  15

Ala Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met
            20                  25                  30

Ser Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu
        35                  40                  45

Thr Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp
    50                  55                  60

Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn
65                  70                  75                  80

Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys
                85                  90                  95

Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe
            100                 105                 110
```

```
Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu
        115                 120                 125

Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu
    130                 135                 140

Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg
145                 150                 155                 160

His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala
                165                 170                 175

Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu
            180                 185                 190

Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr
        195                 200                 205

Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu
    210                 215                 220

Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr
225                 230                 235                 240

Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu
                245                 250                 255

Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe
            260                 265                 270

Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala
        275                 280                 285

Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp
    290                 295                 300

Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu
305                 310                 315                 320

Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly
                325                 330                 335

Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu
            340                 345                 350

Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu
        355                 360                 365
```

```
Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu
    370                 375                 380

Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln
385                 390                 395                 400

Lys Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser
                405                 410                 415

Ala Ser Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met Val
            420                 425                 430

Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn
        435                 440                 445

Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu
    450                 455                 460

Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala
465                 470                 475                 480

Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val
                485                 490                 495

Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val
            500                 505                 510

Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg
        515                 520                 525

Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg
    530                 535                 540

Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys
545                 550                 555                 560

Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val
                565                 570                 575

Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro
            580                 585                 590

Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile
        595                 600                 605

Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val
```

610 615 620

Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe
625 630 635 640

Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
645 650 655

<210> 15
<211> 1890
<212> DNA
<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(1890)
<223>

<400> 15

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cca tcc ccc gac cct tca ccc cga gga ctg ggc gcc tcc tcc ggc gca       48
Pro Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala
1               5                  10                  15

gct gag gga gcg ggg gcc ggt ctc ctg ctc ggt tgt cga gcc tcc atg       96
Ala Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met
            20                  25                  30

tcg gat aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca gag      144
Ser Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu
        35                  40                  45

acg gag tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc agt aag tgg      192
Thr Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp
    50                  55                  60

aca aac tac att cat ggg tgg cag gat cgt tgg gta gtt ttg aaa aat      240
Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn
65                  70                  75                  80

aat gct ctg agt tac tac aaa tct gaa gat gaa aca gag tat ggc tgc      288
Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys
                85                  90                  95

aga gga tcc atc tgt ctt agc aag gct gtc atc aca cct cac gat ttt      336
Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe
            100                 105                 110

gat gaa tgt cga ttt gat att agt gta aat gat agt gtt tgg tat ctt      384
Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu
        115                 120                 125

cgt gct cag gat cca gat cat aga cag caa tgg ata gat gcc att gaa      432
Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu
    130                 135                 140

cag cac aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt cga      480
Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg
```

```
145                 150                 155                 160

cat ggc tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct gca      528
His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala
                165                 170                 175

aca tcc acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag ttg      576
Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu
            180                 185                 190

gct gaa atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac acg      624
Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr
        195                 200                 205

cta cag aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat gaa      672
Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu
    210                 215                 220

ctt caa agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct aca      720
Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr
225                 230                 235                 240

acg cgt tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa gaa      768
Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu
                245                 250                 255

aag tta ttt cca cat gtg aca cca aaa gga att aat ggt ata gac ttt      816
Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe
            260                 265                 270

aaa ggg gaa gcg ata act ttt aaa gca act act gct gga atc ctt gca      864
Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala
        275                 280                 285

aca ctt tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc tgg      912
Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp
    290                 295                 300

cag aag aga ctg gat aag gaa act gag aag aaa aga aga aca gag gaa      960
Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu
305                 310                 315                 320

gca tat aaa aat gca atg aca gaa ctt aag aaa aaa tcc cac ttt gga     1008
Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly
                325                 330                 335

gga cca gat tat gaa gaa ggc cct aac agt ctg att aat gaa gaa gag     1056
Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu
            340                 345                 350

ttc ttt gat gct gtt gaa gct gct ctt gac aga caa gat aaa ata gaa     1104
Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu
        355                 360                 365

gaa cag tca cag agt gaa aag gtg aga tta cat tgg cct aca tcc ttg     1152
Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu
    370                 375                 380

ccc tct gga gat gcc ttt tct tct gtg ggg aca cat aga ttt gtc caa     1200
Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln
385                 390                 395                 400

aag gtt gaa gag atg gtg cag aac cac atg act tac tca tta cag gat     1248
```

```
Lys Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp
                405                 410                 415

gta ggc gga gat gcc aat tgg cag ttg gtt gta gaa gaa gga gaa atg     1296
Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met
            420                 425                 430

aag gta tac aga aga gaa gta gaa gaa aat ggg att gtt ctg gat cct     1344
Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro
        435                 440                 445

tta aaa gct acc cat gca gtt aaa ggc gtc aca gga cat gaa gtc tgc     1392
Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val Cys
    450                 455                 460

aat tat ttc tgg aat gtt gac gtt cgc aat gac tgg gaa aca act ata     1440
Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile
465                 470                 475                 480

gaa aac ttt cat gtg gtg gaa aca tta gct gat aat gca atc atc att     1488
Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile
                485                 490                 495

tat caa aca cac aag agg gtg tgg cct gct tct cag cga gac gta tta     1536
Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu
            500                 505                 510

tat ctt tct gtc att cga aag ata cca gcc ttg act gaa aat gac cct     1584
Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro
        515                 520                 525

gaa act tgg ata gtt tgt aat ttt tct gtg gat cat gac agt gct cct     1632
Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro
    530                 535                 540

cta aac aac cga tgt gtc cgt gcc aaa ata aat gtt gct atg att tgt     1680
Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys
545                 550                 555                 560

caa acc ttg gta agc cca cca gag gga aac cag gaa att agc agg gac     1728
Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp
                565                 570                 575

aac att cta tgc aag att aca tat gta gct aat gtg aac cct gga gga     1776
Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly
            580                 585                 590

tgg gca cca gcc tca gtg tta agg gca gtg gca aag cga gag tat cct     1824
Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro
        595                 600                 605

aaa ttt cta aaa cgt ttt act tct tac gtc caa gaa aaa act gca gga     1872
Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly
    610                 615                 620

aag cct att ttg ttc tag                                           1890
Lys Pro Ile Leu Phe
625
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<210> 16
<211> 629
<212> PRT

<213> artificial

<220>
<223> Derived sequence

<400> 16

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Pro Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala
1               5                  10                  15

Ala Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met
            20                  25                  30

Ser Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu
        35                  40                  45

Thr Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp
    50                  55                  60

Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn
65                  70                  75                  80

Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys
                85                  90                  95

Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe
            100                 105                 110

Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu
        115                 120                 125

Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu
    130                 135                 140

Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg
145                 150                 155                 160

His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala
                165                 170                 175

Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu
            180                 185                 190

Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr
        195                 200                 205

Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu
    210                 215                 220
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```
Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr
225                 230                 235                 240

Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu
                245                 250                 255

Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe
            260                 265                 270

Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala
        275                 280                 285

Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp
    290                 295                 300

Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu
305                 310                 315                 320

Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly
                325                 330                 335

Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu
            340                 345                 350

Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu
        355                 360                 365

Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu
    370                 375                 380

Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln
385                 390                 395                 400

Lys Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp
                405                 410                 415

Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met
            420                 425                 430

Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro
        435                 440                 445

Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val Cys
    450                 455                 460

Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile
465                 470                 475                 480
```

```
Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile
                485                 490                 495

Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu
            500                 505                 510

Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro
        515                 520                 525

Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro
    530                 535                 540

Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys
545                 550                 555                 560

Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp
                565                 570                 575

Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly
            580                 585                 590

Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro
        595                 600                 605

Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly
    610                 615                 620

Lys Pro Ile Leu Phe
625
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<210> 17
<211> 2037
<212> DNA
<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(2037)
<223>

<400> 17

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cgg cgc ggc ggg cgg act tcg tcc ctc ctc ctg ctc ccc ccc aca ccg       48
Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
1               5                   10                  15

gag cgg gca ctc ttc gct tcg cca tcc ccc gac cct tca ccc cga gga       96
Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
            20                  25                  30
```

```
ctg ggc gcc tcc tcc ggc gca gct gag gga gcg ggg gcc ggt ctc ctg      144
Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
        35                  40                  45

ctc ggt tgt cga gcc tcc atg tcg gat aat cag agc tgg aac tcg tcg      192
Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
    50                  55                  60

ggc tcg gag gag gat cca gag acg gag tct ggg ccg cct gtg gag cgc      240
Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
65                  70                  75                  80

tgc ggg gtc ctc agt aag tgg aca aac tac att cat ggg tgg cag gat      288
Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
                85                  90                  95

cgt tgg gta gtt ttg aaa aat aat gct ctg agt tac tac aaa tct gaa      336
Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu
            100                 105                 110

gat gaa aca gag tat ggc tgc aga gga tcc atc tgt ctt agc aag gct      384
Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
        115                 120                 125

gtc atc aca cct cac gat ttt gat gaa tgt cga ttt gat att agt gta      432
Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
    130                 135                 140

aat gat agt gtt tgg tat ctt cgt gct cag gat cca gat cat aga cag      480
Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
145                 150                 155                 160

caa tgg ata gat gcc att gaa cag cac aag act gaa tct gga tat gga      528
Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
                165                 170                 175

tct gaa tcc agc ttg cgt cga cat ggc tca atg gtg tcc ctg gtg tct      576
Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
            180                 185                 190

gga gca agt ggc tac tct gca aca tcc acc tct tca ttc aag aaa ggc      624
Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
        195                 200                 205

cac agt tta cgt gag aag ttg gct gaa atg gaa aca ttt aga gac atc      672
His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
    210                 215                 220

tta tgt aga caa gtt gac acg cta cag aag tac ttt gat gcc tgt gct      720
Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala
225                 230                 235                 240

gat gct gtc tct aag gat gaa ctt caa agg gat aaa gtg gta gaa gat      768
Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
                245                 250                 255

gat gaa gat gac ttt cct aca acg cgt tct gat ggt gac ttc ttg cat      816
Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
            260                 265                 270

agt acc aac ggc aat aaa gaa aag tta ttt cca cat gtg aca cca aaa      864
Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
        275                 280                 285
```

```
gga att aat ggt ata gac ttt aaa ggg gaa gcg ata act ttt aaa gca      912
Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
    290                 295                 300

act act gct gga atc ctt gca aca ctt tct cat tgt att gaa cta atg      960
Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
305                 310                 315                 320

gtt aaa cgt gag gac agc tgg cag aag aga ctg gat aag gaa act gag     1008
Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu
                325                 330                 335

aag aaa aga aga aca gag gaa gca tat aaa aat gca atg aca gaa ctt     1056
Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
            340                 345                 350

aag aaa aaa tcc cac ttt gga gga cca gat tat gaa gaa ggc cct aac     1104
Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
        355                 360                 365

agt ctg att aat gaa gaa gag ttc ttt gat gct gtt gaa gct gct ctt     1152
Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
    370                 375                 380

gac aga caa gat aaa ata gaa gaa cag tca cag agt gaa aag gtg aga     1200
Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
385                 390                 395                 400

tta cat tgg cct aca tcc ttg ccc tct gga gat gcc ttt tct tct gtg     1248
Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val
                405                 410                 415

ggg aca cat aga ttt gtc caa aag ccc tat agt cgc tct tcc tcc atg     1296
Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met
            420                 425                 430

tct tcc att gat cta gtc agt gcc tct gat gat gtt cac aga ttc agc     1344
Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Asp Val His Arg Phe Ser
        435                 440                 445

tcc cag gtt gaa gag atg gtg cag aac cac atg act tac tca tta cag     1392
Ser Gln Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln
    450                 455                 460

gat gta ggc gga gat gcc aat tgg cag ttg gtt gta gaa gaa gga gaa     1440
Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
465                 470                 475                 480

atg aag gta tac aga aga gaa gta gaa gaa aat ggg att gtt ctg gat     1488
Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
                485                 490                 495

cct tta aaa gct acc cat gca gtt aaa ggc gtc aca gga cat gaa gtc     1536
Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
            500                 505                 510

tgc aat tat ttc tgg aat gtt gac gtt cgc aat gac tgg gaa aca act     1584
Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr
        515                 520                 525

ata gaa aac ttt cat gtg gtg gaa aca tta gct gat aat gca atc atc     1632
Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
```

```
    530                 535                 540

att tat caa aca cac aag agg gtg tgg cct gct tct cag cga gac gta     1680
Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
545                 550                 555                 560

tta tat ctt tct gtc att cga aag ata cca gcc ttg act gaa aat gac     1728
Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp
                565                 570                 575

cct gaa act tgg ata gtt tgt aat ttt tct gtg gat cat gac agt gct     1776
Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala
            580                 585                 590

cct cta aac aac cga tgt gtc cgt gcc aaa ata aat gtt gct atg att     1824
Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile
        595                 600                 605

tgt caa acc ttg gta agc cca cca gag gga aac cag gaa att agc agg     1872
Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg
    610                 615                 620

gac aac att cta tgc aag att aca tat gta gct aat gtg aac cct gga     1920
Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
625                 630                 635                 640

gga tgg gca cca gcc tca gtg tta agg gca gtg gca aag cga gag tat     1968
Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
                645                 650                 655

cct aaa ttt cta aaa cgt ttt act tct tac gtc caa gaa aaa act gca     2016
Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala
            660                 665                 670

gga aag cct att ttg ttc tag                                        2037
Gly Lys Pro Ile Leu Phe
        675
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<210> 18
<211> 678
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 18

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Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
1               5                   10                  15

Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
            20                  25                  30

Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
        35                  40                  45

Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
    50                  55                  60
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Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
65 70 75 80

Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
85 90 95

Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu
100 105 110

Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
115 120 125

Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
130 135 140

Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
145 150 155 160

Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
165 170 175

Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
180 185 190

Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
195 200 205

His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
210 215 220

Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala
225 230 235 240

Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
245 250 255

Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
260 265 270

Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
275 280 285

Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
290 295 300

Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met

305 310 315 320

Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu
325 330 335

Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
340 345 350

Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
355 360 365

Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
370 375 380

Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
385 390 395 400

Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val
405 410 415

Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met
420 425 430

Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Asp Val His Arg Phe Ser
435 440 445

Ser Gln Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln
450 455 460

Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
465 470 475 480

Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
485 490 495

Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
500 505 510

Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr
515 520 525

Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
530 535 540

Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
545 550 555 560

```
Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp
                565                 570                 575

Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala
            580                 585                 590

Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile
        595                 600                 605

Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg
    610                 615                 620

Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
625                 630                 635                 640

Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
                645                 650                 655

Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala
            660                 665                 670

Gly Lys Pro Ile Leu Phe
        675
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<210> 19
<211> 1959
<212> DNA
<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(1959)
<223>

<400> 19

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cgg cgc ggc ggg cgg act tcg tcc ctc ctc ctg ctc ccc ccc aca ccg       48
Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
1               5                   10                  15

gag cgg gca ctc ttc gct tcg cca tcc ccc gac cct tca ccc cga gga       96
Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
            20                  25                  30

ctg ggc gcc tcc tcc ggc gca gct gag gga gcg ggg gcc ggt ctc ctg      144
Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
        35                  40                  45

ctc ggt tgt cga gcc tcc atg tcg gat aat cag agc tgg aac tcg tcg      192
Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
    50                  55                  60

ggc tcg gag gag gat cca gag acg gag tct ggg ccg cct gtg gag cgc      240
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```
Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
65                  70                  75                  80

tgc ggg gtc ctc agt aag tgg aca aac tac att cat ggg tgg cag gat      288
Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
                85                  90                  95

cgt tgg gta gtt ttg aaa aat aat gct ctg agt tac tac aaa tct gaa      336
Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu
            100                 105                 110

gat gaa aca gag tat ggc tgc aga gga tcc atc tgt ctt agc aag gct      384
Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
        115                 120                 125

gtc atc aca cct cac gat ttt gat gaa tgt cga ttt gat att agt gta      432
Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
    130                 135                 140

aat gat agt gtt tgg tat ctt cgt gct cag gat cca gat cat aga cag      480
Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
145                 150                 155                 160

caa tgg ata gat gcc att gaa cag cac aag act gaa tct gga tat gga      528
Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
                165                 170                 175

tct gaa tcc agc ttg cgt cga cat ggc tca atg gtg tcc ctg gtg tct      576
Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
            180                 185                 190

gga gca agt ggc tac tct gca aca tcc acc tct tca ttc aag aaa ggc      624
Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
        195                 200                 205

cac agt tta cgt gag aag ttg gct gaa atg gaa aca ttt aga gac atc      672
His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
    210                 215                 220

tta tgt aga caa gtt gac acg cta cag aag tac ttt gat gcc tgt gct      720
Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala
225                 230                 235                 240

gat gct gtc tct aag gat gaa ctt caa agg gat aaa gtg gta gaa gat      768
Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
                245                 250                 255

gat gaa gat gac ttt cct aca acg cgt tct gat ggt gac ttc ttg cat      816
Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
            260                 265                 270

agt acc aac ggc aat aaa gaa aag tta ttt cca cat gtg aca cca aaa      864
Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
        275                 280                 285

gga att aat ggt ata gac ttt aaa ggg gaa gcg ata act ttt aaa gca      912
Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
    290                 295                 300

act act gct gga atc ctt gca aca ctt tct cat tgt att gaa cta atg      960
Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
305                 310                 315                 320
```

```
gtt aaa cgt gag gac agc tgg cag aag aga ctg gat aag gaa act gag      1008
Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu
                325                 330                 335

aag aaa aga aga aca gag gaa gca tat aaa aat gca atg aca gaa ctt      1056
Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
            340                 345                 350

aag aaa aaa tcc cac ttt gga gga cca gat tat gaa gaa ggc cct aac      1104
Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
        355                 360                 365

agt ctg att aat gaa gaa gag ttc ttt gat gct gtt gaa gct gct ctt      1152
Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
    370                 375                 380

gac aga caa gat aaa ata gaa gaa cag tca cag agt gaa aag gtg aga      1200
Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
385                 390                 395                 400

tta cat tgg cct aca tcc ttg ccc tct gga gat gcc ttt tct tct gtg      1248
Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val
                405                 410                 415

ggg aca cat aga ttt gtc caa aag gtt gaa gag atg gtg cag aac cac      1296
Gly Thr His Arg Phe Val Gln Lys Val Glu Glu Met Val Gln Asn His
            420                 425                 430

atg act tac tca tta cag gat gta ggc gga gat gcc aat tgg cag ttg      1344
Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu
        435                 440                 445

gtt gta gaa gaa gga gaa atg aag gta tac aga aga gaa gta gaa gaa      1392
Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu
    450                 455                 460

aat ggg att gtt ctg gat cct tta aaa gct acc cat gca gtt aaa ggc      1440
Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly
465                 470                 475                 480

gtc aca gga cat gaa gtc tgc aat tat ttc tgg aat gtt gac gtt cgc      1488
Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg
                485                 490                 495

aat gac tgg gaa aca act ata gaa aac ttt cat gtg gtg gaa aca tta      1536
Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu
            500                 505                 510

gct gat aat gca atc atc att tat caa aca cac aag agg gtg tgg cct      1584
Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp Pro
        515                 520                 525

gct tct cag cga gac gta tta tat ctt tct gtc att cga aag ata cca      1632
Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro
    530                 535                 540

gcc ttg act gaa aat gac cct gaa act tgg ata gtt tgt aat ttt tct      1680
Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser
545                 550                 555                 560

gtg gat cat gac agt gct cct cta aac aac cga tgt gtc cgt gcc aaa      1728
Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys
                565                 570                 575
```

```
ata aat gtt gct atg att tgt caa acc ttg gta agc cca cca gag gga     1776
Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly
            580                 585                 590

aac cag gaa att agc agg gac aac att cta tgc aag att aca tat gta     1824
Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val
        595                 600                 605

gct aat gtg aac cct gga gga tgg gca cca gcc tca gtg tta agg gca     1872
Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala
    610                 615                 620

gtg gca aag cga gag tat cct aaa ttt cta aaa cgt ttt act tct tac     1920
Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr
625                 630                 635                 640

gtc caa gaa aaa act gca gga aag cct att ttg ttc tag                 1959
Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
                645                 650
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<210> 20
<211> 652
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 20

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Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
1               5                   10                  15

Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
            20                  25                  30

Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
        35                  40                  45

Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
    50                  55                  60

Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
65                  70                  75                  80

Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
                85                  90                  95

Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu
            100                 105                 110

Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
        115                 120                 125
```

```
Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
    130                 135                 140

Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
145                 150                 155                 160

Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
                165                 170                 175

Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
            180                 185                 190

Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
        195                 200                 205

His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
    210                 215                 220

Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala
225                 230                 235                 240

Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
                245                 250                 255

Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
            260                 265                 270

Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
        275                 280                 285

Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
    290                 295                 300

Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
305                 310                 315                 320

Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu
                325                 330                 335

Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
            340                 345                 350

Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
        355                 360                 365

Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
    370                 375                 380
```

Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
385 390 395 400

Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val
405 410 415

Gly Thr His Arg Phe Val Gln Lys Val Glu Glu Met Val Gln Asn His
420 425 430

Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu
435 440 445

Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu
450 455 460

Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly
465 470 475 480

Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg
485 490 495

Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu
500 505 510

Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp Pro
515 520 525

Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro
530 535 540

Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser
545 550 555 560

Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys
565 570 575

Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly
580 585 590

Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val
595 600 605

Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala
610 615 620

Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr

625 630 635 640

Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
645 650

<210> 21
<211> 2109
<212> DNA
<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(2109)
<223>

<400> 21

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gac ggc tgg aag ggt agg ctt cct tca ccg ctc gtc ctc ctt cct cgc       48
Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Val Leu Leu Pro Arg
1               5                   10                  15

tcc gct cgg tgt cag gcg cgg cgg cgg cgc ggc ggg cgg act tcg tcc       96
Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly Arg Thr Ser Ser
            20                  25                  30

ctc ctc ctg ctc ccc ccc aca ccg gag cgg gca ctc ttc gct tcg cca      144
Leu Leu Leu Leu Pro Pro Thr Pro Glu Arg Ala Leu Phe Ala Ser Pro
        35                  40                  45

tcc ccc gac cct tca ccc cga gga ctg ggc gcc tcc tcc ggc gca gct      192
Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala Ala
    50                  55                  60

gag gga gcg ggg gcc ggt ctc ctg ctc ggt tgt cga gcc tcc atg tcg      240
Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser
65                  70                  75                  80

gat aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca gag acg      288
Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr
                85                  90                  95

gag tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc agt aag tgg aca      336
Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr
            100                 105                 110

aac tac att cat ggg tgg cag gat cgt tgg gta gtt ttg aaa aat aat      384
Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn
        115                 120                 125

gct ctg agt tac tac aaa tct gaa gat gaa aca gag tat ggc tgc aga      432
Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg
    130                 135                 140

gga tcc atc tgt ctt agc aag gct gtc atc aca cct cac gat ttt gat      480
Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp
145                 150                 155                 160

gaa tgt cga ttt gat att agt gta aat gat agt gtt tgg tat ctt cgt      528
Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg
```

```
                 165                 170                 175

gct cag gat cca gat cat aga cag caa tgg ata gat gcc att gaa cag      576
Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln
            180                 185                 190

cac aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt cga cat      624
His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His
        195                 200                 205

ggc tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct gca aca      672
Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr
    210                 215                 220

tcc acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag ttg gct      720
Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala
225                 230                 235                 240

gaa atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac acg cta      768
Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu
                245                 250                 255

cag aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat gaa ctt      816
Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu
            260                 265                 270

caa agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct aca acg      864
Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr
        275                 280                 285

cgt tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa gaa aag      912
Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys
    290                 295                 300

tta ttt cca cat gtg aca cca aaa gga att aat ggt ata gac ttt aaa      960
Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys
305                 310                 315                 320

ggg gaa gcg ata act ttt aaa gca act act gct gga atc ctt gca aca     1008
Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr
                325                 330                 335

ctt tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc tgg cag     1056
Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln
            340                 345                 350

aag aga ctg gat aag gaa act gag aag aaa aga aga aca gag gaa gca     1104
Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala
        355                 360                 365

tat aaa aat gca atg aca gaa ctt aag aaa aaa tcc cac ttt gga gga     1152
Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly
    370                 375                 380

cca gat tat gaa gaa ggc cct aac agt ctg att aat gaa gaa gag ttc     1200
Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe
385                 390                 395                 400

ttt gat gct gtt gaa gct gct ctt gac aga caa gat aaa ata gaa gaa     1248
Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu
                405                 410                 415

cag tca cag agt gaa aag gtg aga tta cat tgg cct aca tcc ttg ccc     1296
```

```
Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro
            420                 425                 430

tct gga gat gcc ttt tct tct gtg ggg aca cat aga ttt gtc caa aag     1344
Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys
        435                 440                 445

ccc tat agt cgc tct tcc tcc atg tct tcc att gat cta gtc agt gcc     1392
Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser Ala
    450                 455                 460

tct gat gat gtt cac aga ttc agc tcc cag gtt gaa gag atg gtg cag     1440
Ser Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met Val Gln
465                 470                 475                 480

aac cac atg act tac tca tta cag gat gta ggc gga gat gcc aat tgg     1488
Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp
                485                 490                 495

cag ttg gtt gta gaa gaa gga gaa atg aag gta tac aga aga gaa gta     1536
Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val
            500                 505                 510

gaa gaa aat ggg att gtt ctg gat cct tta aaa gct acc cat gca gtt     1584
Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val
        515                 520                 525

aaa ggc gtc aca gga cat gaa gtc tgc aat tat ttc tgg aat gtt gac     1632
Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp
    530                 535                 540

gtt cgc aat gac tgg gaa aca act ata gaa aac ttt cat gtg gtg gaa     1680
Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu
545                 550                 555                 560

aca tta gct gat aat gca atc atc att tat caa aca cac aag agg gtg     1728
Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val
                565                 570                 575

tgg cct gct tct cag cga gac gta tta tat ctt tct gtc att cga aag     1776
Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys
            580                 585                 590

ata cca gcc ttg act gaa aat gac cct gaa act tgg ata gtt tgt aat     1824
Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn
        595                 600                 605

ttt tct gtg gat cat gac agt gct cct cta aac aac cga tgt gtc cgt     1872
Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg
    610                 615                 620

gcc aaa ata aat gtt gct atg att tgt caa acc ttg gta agc cca cca     1920
Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro
625                 630                 635                 640

gag gga aac cag gaa att agc agg gac aac att cta tgc aag att aca     1968
Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr
                645                 650                 655

tat gta gct aat gtg aac cct gga gga tgg gca cca gcc tca gtg tta     2016
Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu
            660                 665                 670
```

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agg gca gtg gca aag cga gag tat cct aaa ttt cta aaa cgt ttt act     2064
Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr
        675                 680                 685

tct tac gtc caa gaa aaa act gca gga aag cct att ttg ttc tag         2109
Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
    690                 695                 700
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<210> 22
<211> 702
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 22

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Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Val Leu Leu Pro Arg
1               5                   10                  15

Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly Arg Thr Ser Ser
            20                  25                  30

Leu Leu Leu Leu Pro Pro Thr Pro Glu Arg Ala Leu Phe Ala Ser Pro
        35                  40                  45

Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala Ala
    50                  55                  60

Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser
65                  70                  75                  80

Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr
                85                  90                  95

Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr
            100                 105                 110

Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn
        115                 120                 125

Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg
    130                 135                 140

Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp
145                 150                 155                 160

Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg
                165                 170                 175
```

```
Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln
            180                 185                 190

His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His
        195                 200                 205

Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr
    210                 215                 220

Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala
225                 230                 235                 240

Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu
                245                 250                 255

Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu
            260                 265                 270

Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr
        275                 280                 285

Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys
    290                 295                 300

Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys
305                 310                 315                 320

Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr
                325                 330                 335

Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln
            340                 345                 350

Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala
        355                 360                 365

Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly
    370                 375                 380

Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe
385                 390                 395                 400

Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu
                405                 410                 415

Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro
            420                 425                 430
```

Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys
435 440 445

Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser Ala
450 455 460

Ser Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met Val Gln
465 470 475 480

Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp
485 490 495

Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val
500 505 510

Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val
515 520 525

Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp
530 535 540

Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu
545 550 555 560

Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val
565 570 575

Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys
580 585 590

Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn
595 600 605

Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg
610 615 620

Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro
625 630 635 640

Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr
645 650 655

Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu
660 665 670

Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr
675 680 685

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Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
    690                 695                 700


<210>  23
<211>  2031
<212>  DNA
<213>  artificial

<220>
<223>  Derived sequence

<220>
<221>  CDS
<222>  (1)..(2031)
<223>

<400>  23
gac ggc tgg aag ggt agg ctt cct tca ccg ctc gtc ctc ctt cct cgc       48
Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Val Leu Leu Pro Arg
1               5                   10                  15

tcc gct cgg tgt cag gcg cgg cgg cgg cgc ggc ggg cgg act tcg tcc       96
Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly Arg Thr Ser Ser
            20                  25                  30

ctc ctc ctg ctc ccc ccc aca ccg gag cgg gca ctc ttc gct tcg cca      144
Leu Leu Leu Leu Pro Pro Thr Pro Glu Arg Ala Leu Phe Ala Ser Pro
        35                  40                  45

tcc ccc gac cct tca ccc cga gga ctg ggc gcc tcc tcc ggc gca gct      192
Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala Ala
    50                  55                  60

gag gga gcg ggg gcc ggt ctc ctg ctc ggt tgt cga gcc tcc atg tcg      240
Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser
65                  70                  75                  80

gat aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca gag acg      288
Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr
                85                  90                  95

gag tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc agt aag tgg aca      336
Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr
            100                 105                 110

aac tac att cat ggg tgg cag gat cgt tgg gta gtt ttg aaa aat aat      384
Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn
        115                 120                 125

gct ctg agt tac tac aaa tct gaa gat gaa aca gag tat ggc tgc aga      432
Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg
    130                 135                 140

gga tcc atc tgt ctt agc aag gct gtc atc aca cct cac gat ttt gat      480
Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp
145                 150                 155                 160

gaa tgt cga ttt gat att agt gta aat gat agt gtt tgg tat ctt cgt      528
Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg
                165                 170                 175
```

```
gct cag gat cca gat cat aga cag caa tgg ata gat gcc att gaa cag      576
Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln
            180                 185                 190

cac aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt cga cat      624
His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His
        195                 200                 205

ggc tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct gca aca      672
Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr
    210                 215                 220

tcc acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag ttg gct      720
Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala
225                 230                 235                 240

gaa atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac acg cta      768
Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu
                245                 250                 255

cag aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat gaa ctt      816
Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu
            260                 265                 270

caa agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct aca acg      864
Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr
        275                 280                 285

cgt tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa gaa aag      912
Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys
    290                 295                 300

tta ttt cca cat gtg aca cca aaa gga att aat ggt ata gac ttt aaa      960
Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys
305                 310                 315                 320

ggg gaa gcg ata act ttt aaa gca act act gct gga atc ctt gca aca     1008
Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr
                325                 330                 335

ctt tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc tgg cag     1056
Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln
            340                 345                 350

aag aga ctg gat aag gaa act gag aag aaa aga aga aca gag gaa gca     1104
Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala
        355                 360                 365

tat aaa aat gca atg aca gaa ctt aag aaa aaa tcc cac ttt gga gga     1152
Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly
    370                 375                 380

cca gat tat gaa gaa ggc cct aac agt ctg att aat gaa gaa gag ttc     1200
Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe
385                 390                 395                 400

ttt gat gct gtt gaa gct gct ctt gac aga caa gat aaa ata gaa gaa     1248
Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu
                405                 410                 415

cag tca cag agt gaa aag gtg aga tta cat tgg cct aca tcc ttg ccc     1296
Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro
```

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                420                 425                 430

tct gga gat gcc ttt tct tct gtg ggg aca cat aga ttt gtc caa aag     1344
Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys
        435                 440                 445

gtt gaa gag atg gtg cag aac cac atg act tac tca tta cag gat gta     1392
Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val
    450                 455                 460

ggc gga gat gcc aat tgg cag ttg gtt gta gaa gaa gga gaa atg aag     1440
Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys
465                 470                 475                 480

gta tac aga aga gaa gta gaa gaa aat ggg att gtt ctg gat cct tta     1488
Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu
                485                 490                 495

aaa gct acc cat gca gtt aaa ggc gtc aca gga cat gaa gtc tgc aat     1536
Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn
            500                 505                 510

tat ttc tgg aat gtt gac gtt cgc aat gac tgg gaa aca act ata gaa     1584
Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu
        515                 520                 525

aac ttt cat gtg gtg gaa aca tta gct gat aat gca atc atc att tat     1632
Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr
    530                 535                 540

caa aca cac aag agg gtg tgg cct gct tct cag cga gac gta tta tat     1680
Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr
545                 550                 555                 560

ctt tct gtc att cga aag ata cca gcc ttg act gaa aat gac cct gaa     1728
Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu
                565                 570                 575

act tgg ata gtt tgt aat ttt tct gtg gat cat gac agt gct cct cta     1776
Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu
            580                 585                 590

aac aac cga tgt gtc cgt gcc aaa ata aat gtt gct atg att tgt caa     1824
Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln
        595                 600                 605

acc ttg gta agc cca cca gag gga aac cag gaa att agc agg gac aac     1872
Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn
    610                 615                 620

att cta tgc aag att aca tat gta gct aat gtg aac cct gga gga tgg     1920
Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp
625                 630                 635                 640

gca cca gcc tca gtg tta agg gca gtg gca aag cga gag tat cct aaa     1968
Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys
                645                 650                 655

ttt cta aaa cgt ttt act tct tac gtc caa gaa aaa act gca gga aag     2016
Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys
            660                 665                 670

cct att ttg ttc tag                                               2031
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Pro Ile Leu Phe
675

<210> 24
<211> 676
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 24

Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Val Leu Leu Pro Arg
1 5 10 15

Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly Arg Thr Ser Ser
20 25 30

Leu Leu Leu Leu Pro Pro Thr Pro Glu Arg Ala Leu Phe Ala Ser Pro
35 40 45

Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala Ala
50 55 60

Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser
65 70 75 80

Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr
85 90 95

Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr
100 105 110

Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn
115 120 125

Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg
130 135 140

Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp
145 150 155 160

Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg
165 170 175

Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln
180 185 190

His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His

195 200 205

Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr
210 215 220

Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala
225 230 235 240

Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu
245 250 255

Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Leu
260 265 270

Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr
275 280 285

Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys Glu Lys
290 295 300

Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys
305 310 315 320

Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr
325 330 335

Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln
340 345 350

Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu Glu Ala
355 360 365

Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly
370 375 380

Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe
385 390 395 400

Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu
405 410 415

Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro
420 425 430

Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys
435 440 445

Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val
450 455 460

Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys
465 470 475 480

Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu
485 490 495

Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn
500 505 510

Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu
515 520 525

Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr
530 535 540

Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr
545 550 555 560

Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu
565 570 575

Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu
580 585 590

Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln
595 600 605

Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn
610 615 620

Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp
625 630 635 640

Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys
645 650 655

Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys
660 665 670

Pro Ile Leu Phe
675

<210> 25
<211> 2181
<212> DNA

<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(2181)
<223>

<400> 25

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gca tcg agg ggg cta agt tcg ggt ggc agc gcc ggg cgc aac gca ggg       48
Ala Ser Arg Gly Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala Gly
1               5                   10                  15

gtc acg gcg acg gcg gcg gcg gct gac ggc tgg aag ggt agg ctt cct       96
Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu Pro
            20                  25                  30

tca ccg ctc gtc ctc ctt cct cgc tcc gct cgg tgt cag gcg cgg cgg      144
Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg
        35                  40                  45

cgg cgc ggc ggg cgg act tcg tcc ctc ctc ctg ctc ccc ccc aca ccg      192
Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
    50                  55                  60

gag cgg gca ctc ttc gct tcg cca tcc ccc gac cct tca ccc cga gga      240
Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
65                  70                  75                  80

ctg ggc gcc tcc tcc ggc gca gct gag gga gcg ggg gcc ggt ctc ctg      288
Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
                85                  90                  95

ctc ggt tgt cga gcc tcc atg tcg gat aat cag agc tgg aac tcg tcg      336
Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
            100                 105                 110

ggc tcg gag gag gat cca gag acg gag tct ggg ccg cct gtg gag cgc      384
Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
        115                 120                 125

tgc ggg gtc ctc agt aag tgg aca aac tac att cat ggg tgg cag gat      432
Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
    130                 135                 140

cgt tgg gta gtt ttg aaa aat aat gct ctg agt tac tac aaa tct gaa      480
Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu
145                 150                 155                 160

gat gaa aca gag tat ggc tgc aga gga tcc atc tgt ctt agc aag gct      528
Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
                165                 170                 175

gtc atc aca cct cac gat ttt gat gaa tgt cga ttt gat att agt gta      576
Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
            180                 185                 190

aat gat agt gtt tgg tat ctt cgt gct cag gat cca gat cat aga cag      624
Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
        195                 200                 205
```

```
caa tgg ata gat gcc att gaa cag cac aag act gaa tct gga tat gga      672
Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
    210                 215                 220

tct gaa tcc agc ttg cgt cga cat ggc tca atg gtg tcc ctg gtg tct      720
Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
225                 230                 235                 240

gga gca agt ggc tac tct gca aca tcc acc tct tca ttc aag aaa ggc      768
Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
                245                 250                 255

cac agt tta cgt gag aag ttg gct gaa atg gaa aca ttt aga gac atc      816
His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
            260                 265                 270

tta tgt aga caa gtt gac acg cta cag aag tac ttt gat gcc tgt gct      864
Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala
        275                 280                 285

gat gct gtc tct aag gat gaa ctt caa agg gat aaa gtg gta gaa gat      912
Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
    290                 295                 300

gat gaa gat gac ttt cct aca acg cgt tct gat ggt gac ttc ttg cat      960
Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
305                 310                 315                 320

agt acc aac ggc aat aaa gaa aag tta ttt cca cat gtg aca cca aaa     1008
Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
                325                 330                 335

gga att aat ggt ata gac ttt aaa ggg gaa gcg ata act ttt aaa gca     1056
Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
            340                 345                 350

act act gct gga atc ctt gca aca ctt tct cat tgt att gaa cta atg     1104
Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
        355                 360                 365

gtt aaa cgt gag gac agc tgg cag aag aga ctg gat aag gaa act gag     1152
Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu
    370                 375                 380

aag aaa aga aga aca gag gaa gca tat aaa aat gca atg aca gaa ctt     1200
Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
385                 390                 395                 400

aag aaa aaa tcc cac ttt gga gga cca gat tat gaa gaa ggc cct aac     1248
Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
                405                 410                 415

agt ctg att aat gaa gaa gag ttc ttt gat gct gtt gaa gct gct ctt     1296
Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
            420                 425                 430

gac aga caa gat aaa ata gaa gaa cag tca cag agt gaa aag gtg aga     1344
Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
        435                 440                 445

tta cat tgg cct aca tcc ttg ccc tct gga gat gcc ttt tct tct gtg     1392
Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val
    450                 455                 460
```

```
ggg aca cat aga ttt gtc caa aag ccc tat agt cgc tct tcc tcc atg     1440
Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met
465                 470                 475                 480

tct tcc att gat cta gtc agt gcc tct gat gat gtt cac aga ttc agc     1488
Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Asp Val His Arg Phe Ser
                485                 490                 495

tcc cag gtt gaa gag atg gtg cag aac cac atg act tac tca tta cag     1536
Ser Gln Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln
            500                 505                 510

gat gta ggc gga gat gcc aat tgg cag ttg gtt gta gaa gaa gga gaa     1584
Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
        515                 520                 525

atg aag gta tac aga aga gaa gta gaa gaa aat ggg att gtt ctg gat     1632
Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
    530                 535                 540

cct tta aaa gct acc cat gca gtt aaa ggc gtc aca gga cat gaa gtc     1680
Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
545                 550                 555                 560

tgc aat tat ttc tgg aat gtt gac gtt cgc aat gac tgg gaa aca act     1728
Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr
                565                 570                 575

ata gaa aac ttt cat gtg gtg gaa aca tta gct gat aat gca atc atc     1776
Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
            580                 585                 590

att tat caa aca cac aag agg gtg tgg cct gct tct cag cga gac gta     1824
Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
        595                 600                 605

tta tat ctt tct gtc att cga aag ata cca gcc ttg act gaa aat gac     1872
Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp
    610                 615                 620

cct gaa act tgg ata gtt tgt aat ttt tct gtg gat cat gac agt gct     1920
Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala
625                 630                 635                 640

cct cta aac aac cga tgt gtc cgt gcc aaa ata aat gtt gct atg att     1968
Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile
                645                 650                 655

tgt caa acc ttg gta agc cca cca gag gga aac cag gaa att agc agg     2016
Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg
            660                 665                 670

gac aac att cta tgc aag att aca tat gta gct aat gtg aac cct gga     2064
Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
        675                 680                 685

gga tgg gca cca gcc tca gtg tta agg gca gtg gca aag cga gag tat     2112
Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
    690                 695                 700

cct aaa ttt cta aaa cgt ttt act tct tac gtc caa gaa aaa act gca     2160
Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala
```

705 710 715 720

gga aag cct att ttg ttc tag 2181
Gly Lys Pro Ile Leu Phe
725

<210> 26
<211> 726
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 26

Ala Ser Arg Gly Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala Gly
1 5 10 15

Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu Pro
20 25 30

Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg
35 40 45

Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
50 55 60

Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
65 70 75 80

Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
85 90 95

Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
100 105 110

Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
115 120 125

Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
130 135 140

Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu
145 150 155 160

Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
165 170 175

Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
180 185 190

```
Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
        195                 200                 205

Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
    210                 215                 220

Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
225                 230                 235                 240

Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
                245                 250                 255

His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
            260                 265                 270

Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala
        275                 280                 285

Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
    290                 295                 300

Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
305                 310                 315                 320

Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
                325                 330                 335

Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
            340                 345                 350

Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
        355                 360                 365

Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu
    370                 375                 380

Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
385                 390                 395                 400

Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
                405                 410                 415

Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
            420                 425                 430

Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
```

435 440 445

Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val
450 455 460

Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met
465 470 475 480

Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Asp Val His Arg Phe Ser
485 490 495

Ser Gln Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln
500 505 510

Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
515 520 525

Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
530 535 540

Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
545 550 555 560

Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr
565 570 575

Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
580 585 590

Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
595 600 605

Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp
610 615 620

Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala
625 630 635 640

Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile
645 650 655

Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg
660 665 670

Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
675 680 685

```
Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
    690                 695                 700

Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala
705                 710                 715                 720

Gly Lys Pro Ile Leu Phe
                725
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<210> 27
<211> 2103
<212> DNA
<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(2103)
<223>

<400> 27

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gca tcg agg ggg cta agt tcg ggt ggc agc gcc ggg cgc aac gca ggg       48
Ala Ser Arg Gly Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala Gly
1               5                   10                  15

gtc acg gcg acg gcg gcg gcg gct gac ggc tgg aag ggt agg ctt cct       96
Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu Pro
            20                  25                  30

tca ccg ctc gtc ctc ctt cct cgc tcc gct cgg tgt cag gcg cgg cgg      144
Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg
        35                  40                  45

cgg cgc ggc ggg cgg act tcg tcc ctc ctc ctg ctc ccc ccc aca ccg      192
Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
    50                  55                  60

gag cgg gca ctc ttc gct tcg cca tcc ccc gac cct tca ccc cga gga      240
Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
65                  70                  75                  80

ctg ggc gcc tcc tcc ggc gca gct gag gga gcg ggg gcc ggt ctc ctg      288
Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
                85                  90                  95

ctc ggt tgt cga gcc tcc atg tcg gat aat cag agc tgg aac tcg tcg      336
Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
            100                 105                 110

ggc tcg gag gag gat cca gag acg gag tct ggg ccg cct gtg gag cgc      384
Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
        115                 120                 125

tgc ggg gtc ctc agt aag tgg aca aac tac att cat ggg tgg cag gat      432
Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
    130                 135                 140

cgt tgg gta gtt ttg aaa aat aat gct ctg agt tac tac aaa tct gaa      480
```

```
Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu
145                 150                 155                 160

gat gaa aca gag tat ggc tgc aga gga tcc atc tgt ctt agc aag gct      528
Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
                165                 170                 175

gtc atc aca cct cac gat ttt gat gaa tgt cga ttt gat att agt gta      576
Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
            180                 185                 190

aat gat agt gtt tgg tat ctt cgt gct cag gat cca gat cat aga cag      624
Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
        195                 200                 205

caa tgg ata gat gcc att gaa cag cac aag act gaa tct gga tat gga      672
Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
    210                 215                 220

tct gaa tcc agc ttg cgt cga cat ggc tca atg gtg tcc ctg gtg tct      720
Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
225                 230                 235                 240

gga gca agt ggc tac tct gca aca tcc acc tct tca ttc aag aaa ggc      768
Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
                245                 250                 255

cac agt tta cgt gag aag ttg gct gaa atg gaa aca ttt aga gac atc      816
His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
            260                 265                 270

tta tgt aga caa gtt gac acg cta cag aag tac ttt gat gcc tgt gct      864
Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala
        275                 280                 285

gat gct gtc tct aag gat gaa ctt caa agg gat aaa gtg gta gaa gat      912
Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
    290                 295                 300

gat gaa gat gac ttt cct aca acg cgt tct gat ggt gac ttc ttg cat      960
Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
305                 310                 315                 320

agt acc aac ggc aat aaa gaa aag tta ttt cca cat gtg aca cca aaa     1008
Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
                325                 330                 335

gga att aat ggt ata gac ttt aaa ggg gaa gcg ata act ttt aaa gca     1056
Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
            340                 345                 350

act act gct gga atc ctt gca aca ctt tct cat tgt att gaa cta atg     1104
Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
        355                 360                 365

gtt aaa cgt gag gac agc tgg cag aag aga ctg gat aag gaa act gag     1152
Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu
    370                 375                 380

aag aaa aga aga aca gag gaa gca tat aaa aat gca atg aca gaa ctt     1200
Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
385                 390                 395                 400
```

```
aag aaa aaa tcc cac ttt gga gga cca gat tat gaa gaa ggc cct aac     1248
Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
                405                 410                 415

agt ctg att aat gaa gaa gag ttc ttt gat gct gtt gaa gct gct ctt     1296
Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
            420                 425                 430

gac aga caa gat aaa ata gaa gaa cag tca cag agt gaa aag gtg aga     1344
Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
        435                 440                 445

tta cat tgg cct aca tcc ttg ccc tct gga gat gcc ttt tct tct gtg     1392
Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val
    450                 455                 460

ggg aca cat aga ttt gtc caa aag gtt gaa gag atg gtg cag aac cac     1440
Gly Thr His Arg Phe Val Gln Lys Val Glu Glu Met Val Gln Asn His
465                 470                 475                 480

atg act tac tca tta cag gat gta ggc gga gat gcc aat tgg cag ttg     1488
Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu
                485                 490                 495

gtt gta gaa gaa gga gaa atg aag gta tac aga aga gaa gta gaa gaa     1536
Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu
            500                 505                 510

aat ggg att gtt ctg gat cct tta aaa gct acc cat gca gtt aaa ggc     1584
Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly
        515                 520                 525

gtc aca gga cat gaa gtc tgc aat tat ttc tgg aat gtt gac gtt cgc     1632
Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg
    530                 535                 540

aat gac tgg gaa aca act ata gaa aac ttt cat gtg gtg gaa aca tta     1680
Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu
545                 550                 555                 560

gct gat aat gca atc atc att tat caa aca cac aag agg gtg tgg cct     1728
Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp Pro
                565                 570                 575

gct tct cag cga gac gta tta tat ctt tct gtc att cga aag ata cca     1776
Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro
            580                 585                 590

gcc ttg act gaa aat gac cct gaa act tgg ata gtt tgt aat ttt tct     1824
Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser
        595                 600                 605

gtg gat cat gac agt gct cct cta aac aac cga tgt gtc cgt gcc aaa     1872
Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys
    610                 615                 620

ata aat gtt gct atg att tgt caa acc ttg gta agc cca cca gag gga     1920
Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly
625                 630                 635                 640

aac cag gaa att agc agg gac aac att cta tgc aag att aca tat gta     1968
Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val
                645                 650                 655
```

```
gct aat gtg aac cct gga gga tgg gca cca gcc tca gtg tta agg gca     2016
Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala
            660                 665                 670

gtg gca aag cga gag tat cct aaa ttt cta aaa cgt ttt act tct tac     2064
Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr
        675                 680                 685

gtc caa gaa aaa act gca gga aag cct att ttg ttc tag                 2103
Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
    690                 695                 700
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<210> 28
<211> 700
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 28

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Ala Ser Arg Gly Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala Gly
1               5                   10                  15

Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu Pro
            20                  25                  30

Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg
        35                  40                  45

Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
    50                  55                  60

Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
65                  70                  75                  80

Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
                85                  90                  95

Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
            100                 105                 110

Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
        115                 120                 125

Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
    130                 135                 140

Arg Trp Val Val Leu Lys Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu
145                 150                 155                 160
```

```
Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
                165                 170                 175

Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
            180                 185                 190

Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
        195                 200                 205

Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
    210                 215                 220

Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
225                 230                 235                 240

Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
                245                 250                 255

His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
            260                 265                 270

Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala
        275                 280                 285

Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
    290                 295                 300

Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
305                 310                 315                 320

Ser Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
                325                 330                 335

Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
            340                 345                 350

Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
        355                 360                 365

Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu
    370                 375                 380

Lys Lys Arg Arg Thr Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
385                 390                 395                 400

Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
                405                 410                 415
```

Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
420 425 430

Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
435 440 445

Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Ala Phe Ser Ser Val
450 455 460

Gly Thr His Arg Phe Val Gln Lys Val Glu Glu Met Val Gln Asn His
465 470 475 480

Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu
485 490 495

Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu
500 505 510

Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly
515 520 525

Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg
530 535 540

Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu
545 550 555 560

Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp Pro
565 570 575

Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro
580 585 590

Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser
595 600 605

Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys
610 615 620

Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly
625 630 635 640

Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val
645 650 655

Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala

660 665 670

Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr
675 680 685

Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
690 695 700

<210> 29
<211> 13
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 29

Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser
1 5 10

<210> 30
<211> 31
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 30

Pro Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala
1 5 10 15

Ala Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser
20 25 30

<210> 31
<211> 54
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 31

Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
1 5 10 15

Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
20 25 30

Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
35 40 45

Leu Gly Cys Arg Ala Ser
50

<210> 32
<211> 78
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 32

Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Val Leu Leu Pro Arg
1 5 10 15

Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly Arg Thr Ser Ser
20 25 30

Leu Leu Leu Leu Pro Pro Thr Pro Glu Arg Ala Leu Phe Ala Ser Pro
35 40 45

Ser Pro Asp Pro Ser Pro Arg Gly Leu Gly Ala Ser Ser Gly Ala Ala
50 55 60

Glu Gly Ala Gly Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser
65 70 75

<210> 33
<211> 102
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 33

Ala Ser Arg Gly Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala Gly
1 5 10 15

Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu Pro
20 25 30

Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg
35 40 45

Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr Pro
50 55 60

Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly

65 70 75 80

Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu Leu
85 90 95

Leu Gly Cys Arg Ala Ser
100

<210> 34
<211> 103
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 34

Leu Ala Ser Arg Gly Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala
1 5 10 15

Gly Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu
20 25 30

Pro Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg
35 40 45

Arg Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr
50 55 60

Pro Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg
65 70 75 80

Gly Leu Gly Ala Ser Ser Gly Ala Ala Glu Gly Ala Gly Ala Gly Leu
85 90 95

Leu Leu Gly Cys Arg Ala Ser
100

<210> 35
<211> 90
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 35

Leu Ala Ser Arg Gly Leu Ser Ser Gly Gly Ser Ala Gly Arg Asn Ala
1 5 10 15

Gly Val Thr Ala Thr Ala Ala Ala Ala Asp Gly Trp Lys Gly Arg Leu
20 25 30

Pro Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg
35 40 45

Arg Arg Arg Gly Gly Arg Thr Ser Ser Leu Leu Leu Leu Pro Pro Thr
50 55 60

Pro Glu Arg Ala Leu Phe Ala Ser Pro Ser Pro Asp Pro Ser Pro Arg
65 70 75 80

Gly Leu Gly Ala Ser Ser Gly Ala Ala Glu
85 90

<210> 36
<211> 18
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 36

Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly Arg Thr
1 5 10 15

Ser Ser

<210> 37
<211> 897
<212> DNA
<213> artificial

<220>
<223> Derived sequence

<220>
<221> CDS
<222> (1)..(897)
<223>

<400> 37
atg tcg gat aat cag agc tgg aac tcg tcg ggc tcg gag gag gat cca 48
Met Ser Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro
1 5 10 15

gag acg gag tct ggg ccg cct gtg gag cgc tgc ggg gtc ctc agt aag 96
Glu Thr Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys
20 25 30

tgg aca aac tac att cat ggg tgg cag gat cgt tgg gta gtt ttg aaa 144
Trp Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys
35 40 45

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aat aat gct ctg agt tac tac aaa tct gaa gat gaa aca gag tat ggc      192
Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly
    50                  55                  60

tgc aga gga tcc atc tgt ctt agc aag gct gtc atc aca cct cac gat      240
Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp
65                  70                  75                  80

ttt gat gaa tgt cga ttt gat att agt gta aat gat agt gtt tgg tat      288
Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr
                85                  90                  95

ctt cgt gct cag gat cca gat cat aga cag caa tgg ata gat gcc att      336
Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile
            100                 105                 110

gaa cag cac aag act gaa tct gga tat gga tct gaa tcc agc ttg cgt      384
Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg
        115                 120                 125

cga cat ggc tca atg gtg tcc ctg gtg tct gga gca agt ggc tac tct      432
Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser
    130                 135                 140

gca aca tcc acc tct tca ttc aag aaa ggc cac agt tta cgt gag aag      480
Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys
145                 150                 155                 160

ttg gct gaa atg gaa aca ttt aga gac atc tta tgt aga caa gtt gac      528
Leu Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp
                165                 170                 175

acg cta cag aag tac ttt gat gcc tgt gct gat gct gtc tct aag gat      576
Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp
            180                 185                 190

gaa ctt caa agg gat aaa gtg gta gaa gat gat gaa gat gac ttt cct      624
Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro
        195                 200                 205

aca acg cgt tct gat ggt gac ttc ttg cat agt acc aac ggc aat aaa      672
Thr Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys
    210                 215                 220

gaa aag tta ttt cca cat gtg aca cca aaa gga att aat ggt ata gac      720
Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp
225                 230                 235                 240

ttt aaa ggg gaa gcg ata act ttt aaa gca act act gct gga atc ctt      768
Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu
                245                 250                 255

gca aca ctt tct cat tgt att gaa cta atg gtt aaa cgt gag gac agc      816
Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser
            260                 265                 270

tgg cag aag aga ctg gat aag gaa act gag aag aaa aga aga aca gag      864
Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu
        275                 280                 285

gaa gca tat aaa aat gca atg aca gaa ctt aag                          897
Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys
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290 295

<210> 38
<211> 299
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 38

Met Ser Asp Asn Gln Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro
1 5 10 15

Glu Thr Glu Ser Gly Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys
20 25 30

Trp Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys
35 40 45

Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly
50 55 60

Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp
65 70 75 80

Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr
85 90 95

Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile
100 105 110

Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg
115 120 125

Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser
130 135 140

Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys
145 150 155 160

Leu Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp
165 170 175

Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp
180 185 190

Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro
195 200 205

```
Thr Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys
    210                 215                 220

Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp
225                 230                 235                 240

Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu
                245                 250                 255

Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser
            260                 265                 270

Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu
        275                 280                 285

Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys
    290                 295
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<210> 39
<211> 5
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 39

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Ser His Cys Ile Glu
1               5
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<210> 40
<211> 5
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 40

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Ser His Cys Ile Gln
1               5
```

<210> 41
<211> 10
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 41

Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu
1 5 10

<210> 42
<211> 10
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 42

Leu Met Val Lys Arg Glu Asp Ser Trp Gln
1 5 10

<210> 43
<211> 15
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 43

Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg
1 5 10 15

<210> 44
<211> 15
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 44

Ile Leu Ala Thr Leu Ser His Cys Ile Gln Leu Met Val Lys Arg
1 5 10 15

<210> 45
<211> 10
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 45

Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
1 5 10

<210> 46
<211> 26

<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 46

Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser Ala
1 5 10 15

Ser Asp Asp Val His Arg Phe Ser Ser Gln
20 25

<210> 47
<211> 21
<212> RNA
<213> artificial

<220>
<223> Derived sequence

<400> 47
aaacuacauu cauggguggc a 21

<210> 48
<211> 21
<212> RNA
<213> artificial

<220>
<223> Derived sequence

<400> 48
aaacagagua uggcugcaga g 21

<210> 49
<211> 21
<212> RNA
<213> artificial

<220>
<223> Derived sequence

<400> 49
aaguacuuug augccugugc u 21

<210> 50
<211> 21
<212> RNA
<213> artificial

<220>
<223> Derived sequence

<400> 50
aaaggcguca caggacauga a 21

<210> 51
<211> 21
<212> RNA
<213> artificial

<220>
<223> Derived sequence

<400> 51
aagcccuaua gucgcucuuc c 21

<210> 52
<211> 244
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 52

Gly Leu Lys Gly Lys Arg Gly Asp Ser Gly Ser Pro Ala Thr Trp Thr
1 5 10 15

Thr Arg Gly Phe Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro
20 25 30

Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe Leu
35 40 45

Phe Val Gln Gly Asn Gln Arg Ala His Gly Gln Asp Leu Gly Thr Leu
50 55 60

Gly Ser Cys Leu Gln Arg Phe Thr Thr Met Pro Phe Leu Phe Cys Asn
65 70 75 80

Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp
85 90 95

Leu Ser Thr Pro Ala Leu Met Pro Met Asn Met Ala Pro Ile Thr Gly
100 105 110

Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly Pro
115 120 125

Ala Ile Ala Ile Ala Val His Ser Gln Thr Thr Asp Ile Pro Pro Cys
130 135 140

Pro His Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser Phe Ile Met Phe
145 150 155 160

Thr Ser Ala Gly Ser Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro Gly
165 170 175

Ser Cys Leu Glu Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His Gly
180 185 190

Arg Gly Thr Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu Ala
195 200 205

Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro Ile Pro Ser Thr Val
210 215 220

Lys Ala Gly Glu Leu Glu Lys Ile Ile Ser Arg Cys Gln Val Cys Met
225 230 235 240

Lys Lys Arg His

<210> 53
<211> 197
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 53

Met Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu
1 5 10 15

Ala Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg
20 25 30

His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly
35 40 45

Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys Val Pro Trp Leu Lys
50 55 60

Pro Gly Arg Ser Pro Leu Pro Ser His Ala Arg Ser Gln Pro Gly Leu
65 70 75 80

Cys Asn Met Tyr Lys Asp Ser His His Pro Ala Arg Thr Ala His Tyr
85 90 95

Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro
100 105 110

Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro Pro Pro

115 120 125

Ser Gln Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly
130 135 140

Ala Glu Gly Gln Arg Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp
145 150 155 160

Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp Ala Gln Gly Thr
165 170 175

Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser
180 185 190

Pro Met Ala Arg Arg
195

<210> 54
<211> 253
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 54

Met Ala Asn Leu Gly Cys Trp Met Leu Val Leu Phe Val Ala Thr Trp
1 5 10 15

Ser Asp Leu Gly Leu Cys Lys Lys Arg Pro Lys Pro Gly Gly Trp Asn
20 25 30

Thr Gly Gly Ser Arg Tyr Pro Gly Gln Gly Ser Pro Gly Gly Asn Arg
35 40 45

Tyr Pro Pro Gln Gly Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
50 55 60

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Pro His Gly Gly Gly
65 70 75 80

Trp Gly Gln Pro His Gly Gly Gly Trp Gly Gln Gly Gly Gly Thr His
85 90 95

Ser Gln Trp Asn Lys Pro Ser Lys Pro Lys Thr Asn Met Lys His Met
100 105 110

Ala Gly Ala Ala Ala Ala Gly Ala Val Val Gly Gly Leu Gly Gly Tyr
115 120 125

```
Met Leu Gly Ser Ala Met Ser Arg Pro Ile Ile His Phe Gly Ser Asp
    130                 135                 140

Tyr Glu Asp Arg Tyr Tyr Arg Glu Asn Met His Arg Tyr Pro Asn Gln
145                 150                 155                 160

Val Tyr Tyr Arg Pro Met Asp Glu Tyr Ser Asn Gln Asn Asn Phe Val
                165                 170                 175

His Asp Cys Val Asn Ile Thr Ile Lys Gln His Thr Val Thr Thr Thr
            180                 185                 190

Thr Lys Gly Glu Asn Phe Thr Glu Thr Asp Val Lys Met Met Glu Arg
        195                 200                 205

Val Val Glu Gln Met Cys Ile Thr Gln Tyr Glu Arg Glu Ser Gln Ala
    210                 215                 220

Tyr Tyr Gln Arg Gly Ser Ser Met Val Leu Phe Ser Ser Pro Pro Val
225                 230                 235                 240

Ile Leu Leu Ile Ser Phe Leu Ile Phe Leu Ile Val Gly
                245                 250
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<210> 55
<211> 42
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 55

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Asp Ala Glu Phe Arg His Asp Ser Gly Tyr Glu Val His His Gln Lys
1               5                   10                  15

Leu Val Phe Phe Ala Glu Asp Val Gly Ser Asn Lys Gly Ala Ile Ile
            20                  25                  30

Gly Leu Met Val Gly Gly Val Val Ile Ala
        35                  40
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<210> 56
<211> 244
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 56

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Gly Leu Lys Gly Lys Arg Gly Asp Ala Gly Ser Pro Ala Thr Trp Thr
1               5                  10                  15

Thr Arg Gly Phe Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro
            20                  25                  30

Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe Leu
        35                  40                  45

Phe Val Gln Gly Asn Gln Arg Ala His Gly Gln Asp Leu Gly Thr Leu
    50                  55                  60

Gly Ser Cys Leu Gln Arg Phe Thr Thr Met Pro Phe Leu Phe Cys Asn
65                  70                  75                  80

Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp
                85                  90                  95

Leu Ser Thr Pro Ala Leu Met Pro Met Asn Met Ala Pro Ile Thr Gly
            100                 105                 110

Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly Pro
        115                 120                 125

Ala Ile Ala Ile Ala Val His Ser Gln Thr Thr Asp Ile Pro Pro Cys
    130                 135                 140

Pro His Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser Phe Ile Met Phe
145                 150                 155                 160

Thr Ser Ala Gly Ser Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro Gly
                165                 170                 175

Ser Cys Leu Glu Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His Gly
            180                 185                 190

Arg Gly Thr Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu Ala
        195                 200                 205

Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro Ile Pro Ser Thr Val
    210                 215                 220

Lys Ala Gly Glu Leu Glu Lys Ile Ile Ser Arg Cys Gln Val Cys Met
225                 230                 235                 240
```

Lys Lys Arg His

<210> 57
<211> 244
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 57

Gly Leu Lys Gly Lys Arg Gly Asp Asp Gly Ser Pro Ala Thr Trp Thr
1 5 10 15

Thr Arg Gly Phe Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro
20 25 30

Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe Leu
35 40 45

Phe Val Gln Gly Asn Gln Arg Ala His Gly Gln Asp Leu Gly Thr Leu
50 55 60

Gly Ser Cys Leu Gln Arg Phe Thr Thr Met Pro Phe Leu Phe Cys Asn
65 70 75 80

Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp
85 90 95

Leu Ser Thr Pro Ala Leu Met Pro Met Asn Met Ala Pro Ile Thr Gly
100 105 110

Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly Pro
115 120 125

Ala Ile Ala Ile Ala Val His Ser Gln Thr Thr Asp Ile Pro Pro Cys
130 135 140

Pro His Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser Phe Ile Met Phe
145 150 155 160

Thr Ser Ala Gly Ser Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro Gly
165 170 175

Ser Cys Leu Glu Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His Gly
180 185 190

Arg Gly Thr Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu Ala

195 200 205

Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro Ile Pro Ser Thr Val
210 215 220

Lys Ala Gly Glu Leu Glu Lys Ile Ile Ser Arg Cys Gln Val Cys Met
225 230 235 240

Lys Lys Arg His

<210> 58
<211> 20
<212> DNA
<213> artificial

<220>
<223> ON-hmbGPBP

<400> 58
cctccgagcc cgacgagttc 20

<210> 59
<211> 20
<212> DNA
<213> artificial

<220>
<223> ON-dinb1

<400> 59
gaccgaaagg ggcacgcaac 20

<210> 60
<211> 33
<212> DNA
<213> artificial

<220>
<223> ON-GPBP D102

<400> 60
aaaaagaatt cgcatcgagg gggctaagtt cgg 33

<210> 61
<211> 31
<212> DNA
<213> artificial

<220>
<223> ON-GPBP D174

<400> 61
aaaaagaatt cgacggctgg aagggtaggc t 31

<210> 62
<211> 32
<212> DNA
<213> artificial

<220>
<223> ON-GPBP D246

<400> 62
aaaaagaatt ctgtcaggcg cggcggcggc gc 32

<210> 63
<211> 30
<212> DNA
<213> artificial

<220>
<223> ON-GPBP D315

<400> 63
gacgaattcc catcccccga cccttcaccc 30

<210> 64
<211> 33
<212> DNA
<213> artificial

<220>
<223> ON-GPBP D369

<400> 64
aaaaagaatt cggagcgggg gccggtctcc tgc 33

<210> 65
<211> 20
<212> DNA
<213> artificial

<220>
<223> ON-pU1

<400> 65
acgactcact atagggagac 20

<210> 66
<211> 20
<212> DNA
<213> artificial

<220>
<223> ON-pcDNAc

<400> 66
ctctagcatt taggtgacac 20

<210> 67
<211> 33
<212> DNA

<213> artificial

<220>
<223> ON-GPBPMet (mutant)

<400> 67
ggttgtcgag cctccggatc ggataatcag agc 33

<210> 68
<211> 30
<212> DNA
<213> artificial

<220>
<223> ON-PrP-F3

<400> 68
gagaattcag cagtcattat ggcgaacctt 30

<210> 69
<211> 31
<212> DNA
<213> artificial

<220>
<223> ON- PrP-R1

<400> 69
gaactcgagc cttcctcatc ccactatcag g 31

<210> 70
<211> 25
<212> DNA
<213> artificial

<220>
<223> ON-E/K-PrP-F6

<400> 70
tatcacccag tacaagaggg aatct 25

<210> 71
<211> 25
<212> DNA
<213> artificial

<220>
<223> ON-E/K-PrP-R6

<400> 71
agattccctc ttgtactggg tgata 25

<210> 72
<211> 22
<212> DNA
<213> artificial

<220>

<223> ON-E168R-F1

<400> 72
cccatggata ggtacagcaa cc 22

<210> 73
<211> 22
<212> DNA
<213> artificial

<220>
<223> ON-E168R-R1

<400> 73
ggttgctgta cctatccatg gg 22

<210> 74
<211> 25
<212> DNA
<213> artificial

<220>
<223> ON-Q172R-F1

<400> 74
gagtacagca acaggaacaa ctttg 25

<210> 75
<211> 25
<212> DNA
<213> artificial

<220>
<223> ON-Q172R-R1

<400> 75
caaagttgtt cctgttgctg tactc 25

<210> 76
<211> 22
<212> DNA
<213> artificial

<220>
<223> ON-R220A-F1

<400> 76
cagtacgagg cggaatctca gg 22

<210> 77
<211> 22
<212> DNA
<213> artificial

<220>
<223> ON-R220A-R1

<400> 77

cctgagattc cgcctcgtac tg 22

<210> 78
<211> 23
<212> DNA
<213> artificial

<220>
<223> ON-R228A-F1

<400> 78
tattaccagg caggatcgag cat 23

<210> 79
<211> 23
<212> DNA
<213> artificial

<220>
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<210> 80
<211> 64
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<220>
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<400> 80
gatcccacta cattcatggg tggcattcaa gagatgccac ccatgaatgt agttttttg 60

gaaa 64

<210> 81
<211> 64
<212> DNA
<213> artificial

<220>
<223> SiGPBP/D26-1

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agcttttcca aaaaaactac attcatgggt ggcatctctt gaatgccacc catgaatgta 60

gtgg 64

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gaaa 64

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<212> DNA
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<223> SiGPBP/D26-2

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agcttttcca aaaaaacaga gtatggctgc agagtctctt gaactctgca gccatactct 60

gtgg 64

<210> 84
<211> 64
<212> DNA
<213> artificial

<220>
<223> SiGPBP/D26-3

<400> 84
gatcccgtac tttgatgcct gtgctttcaa gagaagcaca ggcatcaaag tacttttttg 60

gaaa 64

<210> 85
<211> 64
<212> DNA
<213> artificial

<220>
<223> SiGPBP/D26-3

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acgg 64

<210> 86
<211> 64
<212> DNA
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<220>
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<400> 86
gatcccaggc gtcacaggac atgaattcaa gagattcatg tcctgtgacg ccttttttg 60

gaaa 64

<210> 87

<211> 64
<212> DNA
<213> artificial

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<223> SiGPBP/D26-4

<400> 87
agcttttcca aaaaaaggcg tcacaggaca tgaatctctt gaattcatgt cctgtgacgc 60

ctgg 64

<210> 88
<211> 64
<212> DNA
<213> artificial

<220>
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<400> 88
gatcccgccc tatagtcgct cttccttcaa gagaggaaga gcgactatag ggctttttg 60

gaaa 64

<210> 89
<211> 64
<212> DNA
<213> artificial

<220>
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<400> 89
agcttttcca aaaaagccct atagtcgctc ttcctctctt gaaggaagag cgactatagg 60

gcgg 64

<210> 90
<211> 14
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 90

Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg
1 5 10

<210> 91
<211> 15
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 91

Val Leu Met Ala Ser Leu Glu Thr Leu Cys Arg Ile His Lys Ile
1 5 10 15

<210> 92
<211> 22
<212> PRT
<213> artificial

<220>
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<400> 92

Lys Gly Lys Pro Gly Asp Thr Gly Pro Pro Ala Ala Gly Ala Val Met
1 5 10 15

Arg Gly Phe Val Phe Thr
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<210> 93
<211> 2760
<212> DNA
<213> Mus musculus

<220>
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<222> (138)..(2318)
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gtgagtgagt ggatctgggt ctctgccgtt ggcttggctc ttcccgtctt cctcccctcc 120

tccctccctg actgagg ttg gca tct agg ggg ccg agt tca ggt ggc ggc 170
Leu Ala Ser Arg Gly Pro Ser Ser Gly Gly Gly
1 5 10

gcc ggg cgc agc gca ggg gtc acg gcc acg gcg gct gac ggc tgg aag 218
Ala Gly Arg Ser Ala Gly Val Thr Ala Thr Ala Ala Asp Gly Trp Lys
15 20 25

ggc agg ctt tct tcg ccg ctc gtc ctc ctt ccc cgg tcc gct cgg tgt 266
Gly Arg Leu Ser Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys
30 35 40

cag gcg cgg cgg cgg cgg cgc ggc ggg cgc gct tcg tcc ctc ttc ctg 314
Gln Ala Arg Arg Arg Arg Arg Gly Gly Arg Ala Ser Ser Leu Phe Leu
45 50 55

ttc cct cac tcc ccg gag cgg gct ctc ttg gcg gtg cca tcc ccc gac 362
Phe Pro His Ser Pro Glu Arg Ala Leu Leu Ala Val Pro Ser Pro Asp
60 65 70 75

cct tca ccc cag gga cta ggc gcc tgc act ggc gca gct cgc gga gcg 410
Pro Ser Pro Gln Gly Leu Gly Ala Cys Thr Gly Ala Ala Arg Gly Ala
80 85 90

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ggg gcc ggt ctc ctg ctc ggc tgt cgc gtc tcc atg tcg gat aac cag      458
Gly Ala Gly Leu Leu Leu Gly Cys Arg Val Ser Met Ser Asp Asn Gln
            95                  100                 105

agc tgg aac tcg tcg ggc tcg gag gag gat ccg gag acg gag tcc ggg      506
Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly
        110                 115                 120

ccg cct gtg gag cgc tgc ggg gtc ctc agc aag tgg aca aac tat att      554
Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile
    125                 130                 135

cat gga tgg cag gat cgt tgg gta gtt ttg aaa aat aat act ttg agt      602
His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Thr Leu Ser
140                 145                 150                 155

tac tac aaa tct gaa gat gaa aca gaa tat ggc tgt agg gga tcc atc      650
Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile
                160                 165                 170

tgt ctt agc aag gct gtg atc acg cct cac gat ttt gat gaa tgc cgg      698
Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg
            175                 180                 185

ttt gat atc agt gta aat gat agt gtt tgg tac ctt cga gct cag gac      746
Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp
        190                 195                 200

ccg gag cac aga cag caa tgg gta gac gcc att gaa cag cac aag act      794
Pro Glu His Arg Gln Gln Trp Val Asp Ala Ile Glu Gln His Lys Thr
    205                 210                 215

gaa tcg gga tat gga tct gag tcc agc ttg cgt aga cat ggc tca atg      842
Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met
220                 225                 230                 235

gtg tca ctg gtg tct gga gcg agt ggc tat tct gct acg tcc acc tct      890
Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser
                240                 245                 250

tct ttc aag aaa ggc cac agt tta cgt gag aaa ctg gct gaa atg gag      938
Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu
            255                 260                 265

aca ttt cgg gac atc ctg tgc cgg cag gtt gat act ctc cag aag tac      986
Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr
        270                 275                 280

ttt gat gtc tgt gct gac gct gtc tcc aag gat gag ctt cag agg gat     1034
Phe Asp Val Cys Ala Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp
    285                 290                 295

aaa gtc gta gaa gat gat gaa gat gac ttc cct aca act cgt tct gat     1082
Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp
300                 305                 310                 315

gga gac ttt ttg cac aat acc aat ggt aat aaa gaa aaa tta ttt cca     1130
Gly Asp Phe Leu His Asn Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro
                320                 325                 330

cat gta aca cca aaa gga att aat ggc ata gac ttt aaa ggg gaa gca     1178
His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala
            335                 340                 345
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ata act ttt aaa gca act act gct gga atc ctt gct aca ctt tct cat     1226
Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His
        350                 355                 360

tgt att gaa tta atg gta aaa cgg gaa gag agc tgg caa aaa aga cac     1274
Cys Ile Glu Leu Met Val Lys Arg Glu Glu Ser Trp Gln Lys Arg His
    365                 370                 375

gat agg gaa gtg gaa aag agg aga cga gtg gag gaa gcg tac aag aat     1322
Asp Arg Glu Val Glu Lys Arg Arg Arg Val Glu Glu Ala Tyr Lys Asn
380                 385                 390                 395

gtg atg gaa gaa ctt aag aag aaa ccc cgt ttc gga ggg ccg gat tat     1370
Val Met Glu Glu Leu Lys Lys Lys Pro Arg Phe Gly Gly Pro Asp Tyr
                400                 405                 410

gaa gaa ggt cca aac agt ctg att aat gag gaa gag ttc ttt gat gct     1418
Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala
            415                 420                 425

gtt gaa gct gct ctt gac aga caa gat aaa ata gag gaa cag tca cag     1466
Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln
        430                 435                 440

agt gaa aag gtc agg tta cac tgg ccc aca tca ttg cca tct gga gac     1514
Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp
    445                 450                 455

acc ttt tct tct gtc ggg acg cat aga ttt gta caa aag ccc tat agt     1562
Thr Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser
460                 465                 470                 475

cgc tct tcc tcc atg tct tcc att gat cta gtc agt gcc tct gac gat     1610
Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Asp
                480                 485                 490

gtt cac aga ttc agc tcc cag gtt gaa gaa atg gta cag aac cac atg     1658
Val His Arg Phe Ser Ser Gln Val Glu Glu Met Val Gln Asn His Met
            495                 500                 505

aat tat tca tta cag gat gta ggt ggt gat gca aat tgg caa ctg gtt     1706
Asn Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val
        510                 515                 520

gtt gaa gaa gga gaa atg aag gta tac aga aga gaa gtg gaa gaa aat     1754
Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn
    525                 530                 535

gga att gtt ctg gat cct ttg aaa gct act cat gca gtt aaa ggt gtt     1802
Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly Val
540                 545                 550                 555

aca gga cat gag gtc tgc aat tac ttt tgg aat gtt gat gtt cgc aat     1850
Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn
                560                 565                 570

gac tgg gaa act act ata gaa aac ttt cat gtg gtg gaa aca tta gct     1898
Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu Ala
            575                 580                 585

gat aat gca atc atc gtt tat caa acg cac aag aga gta tgg ccc gct     1946
Asp Asn Ala Ile Ile Val Tyr Gln Thr His Lys Arg Val Trp Pro Ala
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590 595 600

tct cag aga gac gta ctg tat ctt tct gct att cga aag atc cca gcc 1994
Ser Gln Arg Asp Val Leu Tyr Leu Ser Ala Ile Arg Lys Ile Pro Ala
605 610 615

ttg act gaa aat gac cct gaa act tgg ata gtt tgt aat ttt tct gtg 2042
Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val
620 625 630 635

gat cat gat agt gct cct ctg aac aat cga tgt gtc cgt gcc aaa atc 2090
Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile
640 645 650

aat att gct atg att tgt caa act tta gta agc cca cca gag gga gac 2138
Asn Ile Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asp
655 660 665

cag gag ata agc aga gac aac att ctg tgc aag atc acg tat gta gct 2186
Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala
670 675 680

aat gtg aac cca gga gga tgg gcg cca gct tcg gtc tta aga gca gtg 2234
Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val
685 690 695

gca aag cga gaa tac cct aag ttt cta aaa cgt ttt act tct tat gtc 2282
Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val
700 705 710 715

caa gaa aaa act gca gga aaa cca att ttg ttt tag tattaacagt 2328
Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
720 725

gactgaagca aggctgcgtg acgttccatg ttggagaaag gagggaaaaa ataaaaagaa 2388

tcctctaagc tggaacgtag gatctacagc cttgtctgtg gcccaagaag aaacattgca 2448

atcgtaaagc tgggtatcca gcactagcca tctcctgcta ggcctcctcg ctcagcgtgt 2508

aactataaat acatgtagaa tcacatggat atggctatat ttttatttgc ttgctccttg 2568

gagtgaaaac aaataacttt gaattacaac taggaattaa ccgatgcttt aattttgagg 2628

aacttttca gaatttttta tttaccatgg tccagcctaa gatcctcagt tgtatcaggt 2688

tttgtgcaca aaagaaaagc acaaaagttg aacgcacctg aggcatgtgc tctctgtgca 2748

ccaaatactc ag 2760

<210> 94
<211> 726
<212> PRT
<213> Mus musculus

<400> 94

Leu Ala Ser Arg Gly Pro Ser Ser Gly Gly Gly Ala Gly Arg Ser Ala
1 5 10 15

Gly Val Thr Ala Thr Ala Ala Asp Gly Trp Lys Gly Arg Leu Ser Ser

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            20                  25                  30

Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg Arg
        35                  40                  45

Arg Arg Gly Gly Arg Ala Ser Ser Leu Phe Leu Phe Pro His Ser Pro
    50                  55                  60

Glu Arg Ala Leu Leu Ala Val Pro Ser Pro Asp Pro Ser Pro Gln Gly
65                  70                  75                  80

Leu Gly Ala Cys Thr Gly Ala Ala Arg Gly Ala Gly Ala Gly Leu Leu
                85                  90                  95

Leu Gly Cys Arg Val Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
            100                 105                 110

Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
        115                 120                 125

Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
    130                 135                 140

Arg Trp Val Val Leu Lys Asn Asn Thr Leu Ser Tyr Tyr Lys Ser Glu
145                 150                 155                 160

Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
                165                 170                 175

Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
            180                 185                 190

Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Glu His Arg Gln
        195                 200                 205

Gln Trp Val Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
    210                 215                 220

Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
225                 230                 235                 240

Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
                245                 250                 255

His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
            260                 265                 270
```

Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Val Cys Ala
275 280 285

Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
290 295 300

Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
305 310 315 320

Asn Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
325 330 335

Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
340 345 350

Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
355 360 365

Val Lys Arg Glu Glu Ser Trp Gln Lys Arg His Asp Arg Glu Val Glu
370 375 380

Lys Arg Arg Arg Val Glu Glu Ala Tyr Lys Asn Val Met Glu Glu Leu
385 390 395 400

Lys Lys Lys Pro Arg Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
405 410 415

Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
420 425 430

Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
435 440 445

Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Thr Phe Ser Ser Val
450 455 460

Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met
465 470 475 480

Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Asp Val His Arg Phe Ser
485 490 495

Ser Gln Val Glu Glu Met Val Gln Asn His Met Asn Tyr Ser Leu Gln
500 505 510

Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
515 520 525

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Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
    530                 535                 540

Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
545                 550                 555                 560

Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr
                565                 570                 575

Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
            580                 585                 590

Val Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
        595                 600                 605

Leu Tyr Leu Ser Ala Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp
    610                 615                 620

Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala
625                 630                 635                 640

Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Ile Ala Met Ile
                645                 650                 655

Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asp Gln Glu Ile Ser Arg
            660                 665                 670

Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
        675                 680                 685

Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
    690                 695                 700

Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala
705                 710                 715                 720

Gly Lys Pro Ile Leu Phe
                725
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<210> 95
<211> 2682
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (138)..(2240)
<223>

<400> 95

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gtgagtgagt ggatctgggt ctctgccgtt ggcttggctc ttcccgtctt cctcccctcc    120

tccctccctg actgagg ttg gca tct agg ggg ccg agt tca ggt ggc ggc       170
                   Leu Ala Ser Arg Gly Pro Ser Ser Gly Gly Gly
                   1               5                  10

gcc ggg cgc agc gca ggg gtc acg gcc acg gcg gct gac ggc tgg aag      218
Ala Gly Arg Ser Ala Gly Val Thr Ala Thr Ala Ala Asp Gly Trp Lys
            15                  20                  25

ggc agg ctt tct tcg ccg ctc gtc ctc ctt ccc cgg tcc gct cgg tgt      266
Gly Arg Leu Ser Ser Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys
        30                  35                  40

cag gcg cgg cgg cgg cgg cgc ggc ggg cgc gct tcg tcc ctc ttc ctg      314
Gln Ala Arg Arg Arg Arg Arg Gly Gly Arg Ala Ser Ser Leu Phe Leu
    45                  50                  55

ttc cct cac tcc ccg gag cgg gct ctc ttg gcg gtg cca tcc ccc gac      362
Phe Pro His Ser Pro Glu Arg Ala Leu Leu Ala Val Pro Ser Pro Asp
60                  65                  70                  75

cct tca ccc cag gga cta ggc gcc tgc act ggc gca gct cgc gga gcg      410
Pro Ser Pro Gln Gly Leu Gly Ala Cys Thr Gly Ala Ala Arg Gly Ala
                80                  85                  90

ggg gcc ggt ctc ctg ctc ggc tgt cgc gtc tcc atg tcg gat aac cag      458
Gly Ala Gly Leu Leu Leu Gly Cys Arg Val Ser Met Ser Asp Asn Gln
            95                  100                 105

agc tgg aac tcg tcg ggc tcg gag gag gat ccg gag acg gag tcc ggg      506
Ser Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly
        110                 115                 120

ccg cct gtg gag cgc tgc ggg gtc ctc agc aag tgg aca aac tat att      554
Pro Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile
    125                 130                 135

cat gga tgg cag gat cgt tgg gta gtt ttg aaa aat aat act ttg agt      602
His Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Thr Leu Ser
140                 145                 150                 155

tac tac aaa tct gaa gat gaa aca gaa tat ggc tgt agg gga tcc atc      650
Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile
                160                 165                 170

tgt ctt agc aag gct gtg atc acg cct cac gat ttt gat gaa tgc cgg      698
Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg
            175                 180                 185

ttt gat atc agt gta aat gat agt gtt tgg tac ctt cga gct cag gac      746
Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp
        190                 195                 200

ccg gag cac aga cag caa tgg gta gac gcc att gaa cag cac aag act      794
Pro Glu His Arg Gln Gln Trp Val Asp Ala Ile Glu Gln His Lys Thr
    205                 210                 215

gaa tcg gga tat gga tct gag tcc agc ttg cgt aga cat ggc tca atg      842
Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met
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220                 225                 230                 235

gtg tca ctg gtg tct gga gcg agt ggc tat tct gct acg tcc acc tct      890
Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser
                240                 245                 250

tct ttc aag aaa ggc cac agt tta cgt gag aaa ctg gct gaa atg gag      938
Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu
            255                 260                 265

aca ttt cgg gac atc ctg tgc cgg cag gtt gat act ctc cag aag tac      986
Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr
        270                 275                 280

ttt gat gtc tgt gct gac gct gtc tcc aag gat gag ctt cag agg gat     1034
Phe Asp Val Cys Ala Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp
    285                 290                 295

aaa gtc gta gaa gat gat gaa gat gac ttc cct aca act cgt tct gat     1082
Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp
300                 305                 310                 315

gga gac ttt ttg cac aat acc aat ggt aat aaa gaa aaa tta ttt cca     1130
Gly Asp Phe Leu His Asn Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro
                320                 325                 330

cat gta aca cca aaa gga att aat ggc ata gac ttt aaa ggg gaa gca     1178
His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala
            335                 340                 345

ata act ttt aaa gca act act gct gga atc ctt gct aca ctt tct cat     1226
Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His
        350                 355                 360

tgt att gaa tta atg gta aaa cgg gaa gag agc tgg caa aaa aga cac     1274
Cys Ile Glu Leu Met Val Lys Arg Glu Glu Ser Trp Gln Lys Arg His
    365                 370                 375

gat agg gaa gtg gaa aag agg aga cga gtg gag gaa gcg tac aag aat     1322
Asp Arg Glu Val Glu Lys Arg Arg Arg Val Glu Glu Ala Tyr Lys Asn
380                 385                 390                 395

gtg atg gaa gaa ctt aag aag aaa ccc cgt ttc gga ggg ccg gat tat     1370
Val Met Glu Glu Leu Lys Lys Lys Pro Arg Phe Gly Gly Pro Asp Tyr
                400                 405                 410

gaa gaa ggt cca aac agt ctg att aat gag gaa gag ttc ttt gat gct     1418
Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala
            415                 420                 425

gtt gaa gct gct ctt gac aga caa gat aaa ata gag gaa cag tca cag     1466
Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln
        430                 435                 440

agt gaa aag gtc agg tta cac tgg ccc aca tca ttg cca tct gga gac     1514
Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp
    445                 450                 455

acc ttt tct tct gtc ggg acg cat aga ttt gta caa aag gtt gaa gaa     1562
Thr Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Val Glu Glu
460                 465                 470                 475

atg gta cag aac cac atg aat tat tca tta cag gat gta ggt ggt gat     1610
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Met Val Gln Asn His Met Asn Tyr Ser Leu Gln Asp Val Gly Gly Asp
                480                 485                 490

gca aat tgg caa ctg gtt gtt gaa gaa gga gaa atg aag gta tac aga     1658
Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg
            495                 500                 505

aga gaa gtg gaa gaa aat gga att gtt ctg gat cct ttg aaa gct act     1706
Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr
        510                 515                 520

cat gca gtt aaa ggt gtt aca gga cat gag gtc tgc aat tac ttt tgg     1754
His Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp
    525                 530                 535

aat gtt gat gtt cgc aat gac tgg gaa act act ata gaa aac ttt cat     1802
Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His
540                 545                 550                 555

gtg gtg gaa aca tta gct gat aat gca atc atc gtt tat caa acg cac     1850
Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Val Tyr Gln Thr His
                560                 565                 570

aag aga gta tgg ccc gct tct cag aga gac gta ctg tat ctt tct gct     1898
Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Ala
            575                 580                 585

att cga aag atc cca gcc ttg act gaa aat gac cct gaa act tgg ata     1946
Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile
        590                 595                 600

gtt tgt aat ttt tct gtg gat cat gat agt gct cct ctg aac aat cga     1994
Val Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg
    605                 610                 615

tgt gtc cgt gcc aaa atc aat att gct atg att tgt caa act tta gta     2042
Cys Val Arg Ala Lys Ile Asn Ile Ala Met Ile Cys Gln Thr Leu Val
620                 625                 630                 635

agc cca cca gag gga gac cag gag ata agc aga gac aac att ctg tgc     2090
Ser Pro Pro Glu Gly Asp Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys
                640                 645                 650

aag atc acg tat gta gct aat gtg aac cca gga gga tgg gcg cca gct     2138
Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala
            655                 660                 665

tcg gtc tta aga gca gtg gca aag cga gaa tac cct aag ttt cta aaa     2186
Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys
        670                 675                 680

cgt ttt act tct tat gtc caa gaa aaa act gca gga aaa cca att ttg     2234
Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu
    685                 690                 695

ttt tag tattaacagt gactgaagca aggctgcgtg acgttccatg ttggagaaag     2290
Phe
700

gagggaaaaa ataaaaagaa tcctctaagc tggaacgtag gatctacagc cttgtctgtg   2350

gcccaagaag aaacattgca atcgtaaagc tgggtatcca gcactagcca tctcctgcta   2410
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ggcctcctcg ctcagcgtgt aactataaat acatgtagaa tcacatggat atggctatat 2470

ttttatttgc ttgctccttg gagtgaaaac aaataacttt gaattacaac taggaattaa 2530

ccgatgcttt aattttgagg aacttttca gaatttttta tttaccatgg tccagcctaa 2590

gatcctcagt tgtatcaggt tttgtgcaca aaagaaaagc acaaaagttg aacgcacctg 2650

aggcatgtgc tctctgtgca ccaaatactc ag 2682

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<212> PRT
<213> Mus musculus

<400> 96

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Gly Val Thr Ala Thr Ala Ala Asp Gly Trp Lys Gly Arg Leu Ser Ser
20 25 30

Pro Leu Val Leu Leu Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg Arg
35 40 45

Arg Arg Gly Gly Arg Ala Ser Ser Leu Phe Leu Phe Pro His Ser Pro
50 55 60

Glu Arg Ala Leu Leu Ala Val Pro Ser Pro Asp Pro Ser Pro Gln Gly
65 70 75 80

Leu Gly Ala Cys Thr Gly Ala Ala Arg Gly Ala Gly Ala Gly Leu Leu
85 90 95

Leu Gly Cys Arg Val Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
100 105 110

Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
115 120 125

Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
130 135 140

Arg Trp Val Val Leu Lys Asn Asn Thr Leu Ser Tyr Tyr Lys Ser Glu
145 150 155 160

Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
165 170 175

Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val

```
            180                 185                 190

Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Glu His Arg Gln
        195                 200                 205

Gln Trp Val Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
    210                 215                 220

Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
225                 230                 235                 240

Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
                245                 250                 255

His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
            260                 265                 270

Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Tyr Phe Asp Val Cys Ala
        275                 280                 285

Asp Ala Val Ser Lys Asp Glu Leu Gln Arg Asp Lys Val Val Glu Asp
    290                 295                 300

Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
305                 310                 315                 320

Asn Thr Asn Gly Asn Lys Glu Lys Leu Phe Pro His Val Thr Pro Lys
                325                 330                 335

Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
            340                 345                 350

Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
        355                 360                 365

Val Lys Arg Glu Glu Ser Trp Gln Lys Arg His Asp Arg Glu Val Glu
    370                 375                 380

Lys Arg Arg Arg Val Glu Glu Ala Tyr Lys Asn Val Met Glu Glu Leu
385                 390                 395                 400

Lys Lys Lys Pro Arg Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
                405                 410                 415

Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
            420                 425                 430
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```
Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
        435                 440                 445

Leu His Trp Pro Thr Ser Leu Pro Ser Gly Asp Thr Phe Ser Ser Val
    450                 455                 460

Gly Thr His Arg Phe Val Gln Lys Val Glu Glu Met Val Gln Asn His
465                 470                 475                 480

Met Asn Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu
                485                 490                 495

Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu
            500                 505                 510

Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly
        515                 520                 525

Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg
    530                 535                 540

Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu
545                 550                 555                 560

Ala Asp Asn Ala Ile Ile Val Tyr Gln Thr His Lys Arg Val Trp Pro
                565                 570                 575

Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Ala Ile Arg Lys Ile Pro
            580                 585                 590

Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser
        595                 600                 605

Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys
    610                 615                 620

Ile Asn Ile Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly
625                 630                 635                 640

Asp Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val
                645                 650                 655

Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala
            660                 665                 670

Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr
        675                 680                 685
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Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
    690                 695                 700


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<212>  DNA
<213>  Bos taurus

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<222>  (103)..(2295)
<223>

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ttccctcttc ccgtctttct cctcttttcc tctcccccga gg ttg gca tcg agg       114
                                               Leu Ala Ser Arg
                                               1

ggg cca aat tcg ggc ggc ggc gcc ggg cgc agc gca ggg gtc aca acg       162
Gly Pro Asn Ser Gly Gly Gly Ala Gly Arg Ser Ala Gly Val Thr Thr
5                   10                  15                  20

acg gcg acg gct gac ggt tgg aag ggc agg ctt cct tcg ccc ctc gac       210
Thr Ala Thr Ala Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Asp
                25                  30                  35

ctc ctt ccc cgg tcc gct tgg tgt cag gcg cgg cgg cgg cgg cgg cgg       258
Leu Leu Pro Arg Ser Ala Trp Cys Gln Ala Arg Arg Arg Arg Arg Arg
            40                  45                  50

cgg cgc ggc ggg cgg act cca tcc ctc ctc ccg ctc cct cct gca ccg       306
Arg Arg Gly Gly Arg Thr Pro Ser Leu Leu Pro Leu Pro Pro Ala Pro
        55                  60                  65

gag cgg gca ctc ctt cct tcg cca tcc ccc gac cct tca ccc cgg gga       354
Glu Arg Ala Leu Leu Pro Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
    70                  75                  80

ctg ggc gcc tcc acc ggc gca gct cag gga gcg ggg gcc ggt ctc ctg       402
Leu Gly Ala Ser Thr Gly Ala Ala Gln Gly Ala Gly Ala Gly Leu Leu
85                  90                  95                  100

ctc ggc tgt cgc gcc tcc atg tcg gat aac cag agc tgg aac tcg tcg       450
Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
                105                 110                 115

ggc tcg gag gag gat ccg gag acg gag tcc ggg ccg ccg gtg gag cgc       498
Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
            120                 125                 130

tgc gga gtc ctc agc aag tgg aca aac tat att cat ggg tgg cag gat       546
Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
        135                 140                 145

cgc tgg gta gtt ttg aaa aat aac act ctg agt tac tac aaa tct gaa       594
Arg Trp Val Val Leu Lys Asn Asn Thr Leu Ser Tyr Tyr Lys Ser Glu
    150                 155                 160

gat gag aca gag tat ggc tgc aga gga tcc atc tgt ctt agc aag gct       642
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Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
165                 170                 175                 180

gtc atc acg cct cat gat ttt gat gaa tgc cga ttt gat att agt gta      690
Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
                185                 190                 195

aat gat agt gtt tgg tat ctt cgt gct caa gat cca gat cac aga cag      738
Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
            200                 205                 210

cag tgg ata gat gcc att gaa cag cac aag act gaa tct gga tat gga      786
Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
        215                 220                 225

tct gaa tcc agc ttg cgt cga cat ggc tcc atg gta tca ttg gta tcc      834
Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
    230                 235                 240

gga gca agt ggc tat tct gca aca tcc acc tcc tca ttc aag aag ggc      882
Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
245                 250                 255                 260

cac agt tta cgt gag aaa ctg gct gaa atg gaa acc ttt aga gat ata      930
His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
                265                 270                 275

ctg tgt aga caa gtt gat acc cta cag aag ttc ttt gat gcc tgt gct      978
Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Phe Phe Asp Ala Cys Ala
            280                 285                 290

gat gct gtc tcc aag gat gaa ttt caa agg gat aaa gtg gta gaa gat     1026
Asp Ala Val Ser Lys Asp Glu Phe Gln Arg Asp Lys Val Val Glu Asp
        295                 300                 305

gat gaa gat gac ttt cct acg aca cgt tct gat gga gac ttc ttg cat     1074
Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
    310                 315                 320

aat acc aat ggc aat aag gaa aag gta ttt cca cat gta aca cca aaa     1122
Asn Thr Asn Gly Asn Lys Glu Lys Val Phe Pro His Val Thr Pro Lys
325                 330                 335                 340

gga att aat ggt ata gac ttt aaa ggt gag gcg ata act ttt aaa gca     1170
Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
                345                 350                 355

act act gcc gga atc ctt gct aca ctt tct cat tgt att gag ctg atg     1218
Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
            360                 365                 370

gta aaa cgt gag gac agc tgg caa aag aga atg gac aag gaa act gag     1266
Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Met Asp Lys Glu Thr Glu
        375                 380                 385

aag aga aga aga gtg gag gaa gca tac aaa aat gcc atg aca gaa ctt     1314
Lys Arg Arg Arg Val Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
    390                 395                 400

aag aaa aaa tcc cac ttt gga gga cca gat tat gag gaa ggc cca aac     1362
Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
405                 410                 415                 420
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agt ttg att aat gaa gag gag ttc ttt gat gct gtt gaa gct gct ctt     1410
Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
                425                 430                 435

gac aga caa gat aaa ata gaa gaa cag tcg cag agt gaa aag gtc agg     1458
Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
            440                 445                 450

tta cat tgg tct act tca atg cca tct gga gat gcc ttt tct tct gtg     1506
Leu His Trp Ser Thr Ser Met Pro Ser Gly Asp Ala Phe Ser Ser Val
        455                 460                 465

ggg act cat aga ttt gtc caa aag ccc tat agt cgc tct tcc tcc atg     1554
Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met
    470                 475                 480

tct tcc att gat cta gtc agt gcc tct gac ggt gtt cac aga ttc agc     1602
Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Gly Val His Arg Phe Ser
485                 490                 495                 500

tcc cag gtt gaa gag atg gtg cag aac cac atg acc tat tca ttg cag     1650
Ser Gln Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln
                505                 510                 515

gat gta ggt ggg gac gcc aac tgg cag ttg gtt gta gaa gaa ggg gag     1698
Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
            520                 525                 530

atg aag gta tat aga aga gaa gta gaa gaa aat ggg att gtt ctg gat     1746
Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
        535                 540                 545

cct ttg aaa gct acc cat gca gtt aaa ggc gtt aca gga cac gag gtc     1794
Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
    550                 555                 560

tgc aat tac ttc tgg aat gtt gat gtt cgc aat gat tgg gaa aca act     1842
Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr
565                 570                 575                 580

ata gaa aac ttt cat gtg gtg gaa aca tta gct gat aat gca atc atc     1890
Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
                585                 590                 595

att tat caa acg cac aag aga gtg tgg cca gcc tct cag cgg gat gtc     1938
Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
            600                 605                 610

tta tat ctg tct gcc att cga aag ata cca gct ttg aat gaa aat gac     1986
Leu Tyr Leu Ser Ala Ile Arg Lys Ile Pro Ala Leu Asn Glu Asn Asp
        615                 620                 625

ccg gag act tgg ata gtt tgt aat ttt tct gta gat cac agc agt gct     2034
Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Ser Ser Ala
    630                 635                 640

cct cta aac aat cga tgt gtc cgt gcc aaa ata aac gtt gct atg att     2082
Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile
645                 650                 655                 660

tgt cag acc ttg gtg agc ccc cca gag gga aac cag gag att agc agg     2130
Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg
                665                 670                 675
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gac aac att cta tgc aag att aca tac gtg gcc aat gta aac cct gga     2178
Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
            680                 685                 690

gga tgg gcc cca gcc tca gtg tta cgg gca gtg gca aag cga gaa tat     2226
Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
        695                 700                 705

cca aag ttt cta aag cgt ttt act tct tac gta caa gaa aaa act gca     2274
Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala
    710                 715                 720

gga aaa cct att ttg ttc tag tattaacagt gactgaagca aggctgtgtg       2325
Gly Lys Pro Ile Leu Phe
725                 730

acattccatg ttggaggaaa aaaaaaaaaa aaaaaa                            2361
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<213> Bos taurus

<400> 98

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1               5                   10                  15

Gly Val Thr Thr Thr Ala Thr Ala Asp Gly Trp Lys Gly Arg Leu Pro
            20                  25                  30

Ser Pro Leu Asp Leu Leu Pro Arg Ser Ala Trp Cys Gln Ala Arg Arg
        35                  40                  45

Arg Arg Arg Arg Arg Arg Gly Gly Arg Thr Pro Ser Leu Leu Pro Leu
    50                  55                  60

Pro Pro Ala Pro Glu Arg Ala Leu Leu Pro Ser Pro Ser Pro Asp Pro
65                  70                  75                  80

Ser Pro Arg Gly Leu Gly Ala Ser Thr Gly Ala Ala Gln Gly Ala Gly
                85                  90                  95

Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser
            100                 105                 110

Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro
        115                 120                 125

Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His
    130                 135                 140
```

```
Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Thr Leu Ser Tyr
145                 150                 155                 160

Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys
                165                 170                 175

Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe
            180                 185                 190

Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro
        195                 200                 205

Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu
    210                 215                 220

Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val
225                 230                 235                 240

Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser
                245                 250                 255

Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr
            260                 265                 270

Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Phe Phe
        275                 280                 285

Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Phe Gln Arg Asp Lys
    290                 295                 300

Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly
305                 310                 315                 320

Asp Phe Leu His Asn Thr Asn Gly Asn Lys Glu Lys Val Phe Pro His
                325                 330                 335

Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile
            340                 345                 350

Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys
        355                 360                 365

Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Met Asp
    370                 375                 380

Lys Glu Thr Glu Lys Arg Arg Arg Val Glu Glu Ala Tyr Lys Asn Ala
385                 390                 395                 400
```

Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu
405 410 415

Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val
420 425 430

Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser
435 440 445

Glu Lys Val Arg Leu His Trp Ser Thr Ser Met Pro Ser Gly Asp Ala
450 455 460

Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Pro Tyr Ser Arg
465 470 475 480

Ser Ser Ser Met Ser Ser Ile Asp Leu Val Ser Ala Ser Asp Gly Val
485 490 495

His Arg Phe Ser Ser Gln Val Glu Glu Met Val Gln Asn His Met Thr
500 505 510

Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val
515 520 525

Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly
530 535 540

Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr
545 550 555 560

Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp
565 570 575

Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp
580 585 590

Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser
595 600 605

Gln Arg Asp Val Leu Tyr Leu Ser Ala Ile Arg Lys Ile Pro Ala Leu
610 615 620

Asn Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp
625 630 635 640

His Ser Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn
645 650 655

```
Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln
            660                 665                 670

Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn
        675                 680                 685

Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala
    690                 695                 700

Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln
705                 710                 715                 720

Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
                725                 730
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<211> 2283
<212> DNA
<213> Bos taurus

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<221> CDS
<222> (103)..(2217)
<223>

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ttccctcttc ccgtctttct cctcttttcc tctcccccga gg ttg gca tcg agg       114
                                                Leu Ala Ser Arg
                                                1

ggg cca aat tcg ggc ggc ggc gcc ggg cgc agc gca ggg gtc aca acg       162
Gly Pro Asn Ser Gly Gly Gly Ala Gly Arg Ser Ala Gly Val Thr Thr
5                   10                  15                  20

acg gcg acg gct gac ggt tgg aag ggc agg ctt cct tcg ccc ctc gac       210
Thr Ala Thr Ala Asp Gly Trp Lys Gly Arg Leu Pro Ser Pro Leu Asp
                25                  30                  35

ctc ctt ccc cgg tcc gct tgg tgt cag gcg cgg cgg cgg cgg cgg cgg       258
Leu Leu Pro Arg Ser Ala Trp Cys Gln Ala Arg Arg Arg Arg Arg Arg
            40                  45                  50

cgg cgc ggc ggg cgg act cca tcc ctc ctc ccg ctc cct cct gca ccg       306
Arg Arg Gly Gly Arg Thr Pro Ser Leu Leu Pro Leu Pro Pro Ala Pro
        55                  60                  65

gag cgg gca ctc ctt cct tcg cca tcc ccc gac cct tca ccc cgg gga       354
Glu Arg Ala Leu Leu Pro Ser Pro Ser Pro Asp Pro Ser Pro Arg Gly
    70                  75                  80

ctg ggc gcc tcc acc ggc gca gct cag gga gcg ggg gcc ggt ctc ctg       402
Leu Gly Ala Ser Thr Gly Ala Ala Gln Gly Ala Gly Ala Gly Leu Leu
85                  90                  95                  100
```

```
ctc ggc tgt cgc gcc tcc atg tcg gat aac cag agc tgg aac tcg tcg      450
Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser Trp Asn Ser Ser
                105                 110                 115

ggc tcg gag gag gat ccg gag acg gag tcc ggg ccg ccg gtg gag cgc      498
Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro Pro Val Glu Arg
            120                 125                 130

tgc gga gtc ctc agc aag tgg aca aac tat att cat ggg tgg cag gat      546
Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His Gly Trp Gln Asp
        135                 140                 145

cgc tgg gta gtt ttg aaa aat aac act ctg agt tac tac aaa tct gaa      594
Arg Trp Val Val Leu Lys Asn Asn Thr Leu Ser Tyr Tyr Lys Ser Glu
    150                 155                 160

gat gag aca gag tat ggc tgc aga gga tcc atc tgt ctt agc aag gct      642
Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala
165                 170                 175                 180

gtc atc acg cct cat gat ttt gat gaa tgc cga ttt gat att agt gta      690
Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe Asp Ile Ser Val
                185                 190                 195

aat gat agt gtt tgg tat ctt cgt gct caa gat cca gat cac aga cag      738
Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro Asp His Arg Gln
            200                 205                 210

cag tgg ata gat gcc att gaa cag cac aag act gaa tct gga tat gga      786
Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu Ser Gly Tyr Gly
        215                 220                 225

tct gaa tcc agc ttg cgt cga cat ggc tcc atg gta tca ttg gta tcc      834
Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val Ser Leu Val Ser
    230                 235                 240

gga gca agt ggc tat tct gca aca tcc acc tcc tca ttc aag aag ggc      882
Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly
245                 250                 255                 260

cac agt tta cgt gag aaa ctg gct gaa atg gaa acc ttt aga gat ata      930
His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr Phe Arg Asp Ile
                265                 270                 275

ctg tgt aga caa gtt gat acc cta cag aag ttc ttt gat gcc tgt gct      978
Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Phe Phe Asp Ala Cys Ala
            280                 285                 290

gat gct gtc tcc aag gat gaa ttt caa agg gat aaa gtg gta gaa gat     1026
Asp Ala Val Ser Lys Asp Glu Phe Gln Arg Asp Lys Val Val Glu Asp
        295                 300                 305

gat gaa gat gac ttt cct acg aca cgt tct gat gga gac ttc ttg cat     1074
Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly Asp Phe Leu His
    310                 315                 320

aat acc aat ggc aat aag gaa aag gta ttt cca cat gta aca cca aaa     1122
Asn Thr Asn Gly Asn Lys Glu Lys Val Phe Pro His Val Thr Pro Lys
325                 330                 335                 340

gga att aat ggt ata gac ttt aaa ggt gag gcg ata act ttt aaa gca     1170
Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala
                345                 350                 355
```

```
act act gcc gga atc ctt gct aca ctt tct cat tgt att gag ctg atg      1218
Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys Ile Glu Leu Met
            360                 365                 370

gta aaa cgt gag gac agc tgg caa aag aga atg gac aag gaa act gag      1266
Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Met Asp Lys Glu Thr Glu
        375                 380                 385

aag aga aga aga gtg gag gaa gca tac aaa aat gcc atg aca gaa ctt      1314
Lys Arg Arg Arg Val Glu Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu
    390                 395                 400

aag aaa aaa tcc cac ttt gga gga cca gat tat gag gaa ggc cca aac      1362
Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn
405                 410                 415                 420

agt ttg att aat gaa gag gag ttc ttt gat gct gtt gaa gct gct ctt      1410
Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val Glu Ala Ala Leu
                425                 430                 435

gac aga caa gat aaa ata gaa gaa cag tcg cag agt gaa aag gtc agg      1458
Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser Glu Lys Val Arg
            440                 445                 450

tta cat tgg tct act tca atg cca tct gga gat gcc ttt tct tct gtg      1506
Leu His Trp Ser Thr Ser Met Pro Ser Gly Asp Ala Phe Ser Ser Val
        455                 460                 465

ggg act cat aga ttt gtc caa aag gtt gaa gag atg gtg cag aac cac      1554
Gly Thr His Arg Phe Val Gln Lys Val Glu Glu Met Val Gln Asn His
    470                 475                 480

atg acc tat tca ttg cag gat gta ggt ggg gac gcc aac tgg cag ttg      1602
Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala Asn Trp Gln Leu
485                 490                 495                 500

gtt gta gaa gaa ggg gag atg aag gta tat aga aga gaa gta gaa gaa      1650
Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg Glu Val Glu Glu
                505                 510                 515

aat ggg att gtt ctg gat cct ttg aaa gct acc cat gca gtt aaa ggc      1698
Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His Ala Val Lys Gly
            520                 525                 530

gtt aca gga cac gag gtc tgc aat tac ttc tgg aat gtt gat gtt cgc      1746
Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn Val Asp Val Arg
        535                 540                 545

aat gat tgg gaa aca act ata gaa aac ttt cat gtg gtg gaa aca tta      1794
Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val Val Glu Thr Leu
    550                 555                 560

gct gat aat gca atc atc att tat caa acg cac aag aga gtg tgg cca      1842
Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys Arg Val Trp Pro
565                 570                 575                 580

gcc tct cag cgg gat gtc tta tat ctg tct gcc att cga aag ata cca      1890
Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Ala Ile Arg Lys Ile Pro
                585                 590                 595

gct ttg aat gaa aat gac ccg gag act tgg ata gtt tgt aat ttt tct      1938
Ala Leu Asn Glu Asn Asp Pro Glu Thr Trp Ile Val Cys Asn Phe Ser
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            600                 605                 610

gta gat cac agc agt gct cct cta aac aat cga tgt gtc cgt gcc aaa     1986
Val Asp His Ser Ser Ala Pro Leu Asn Asn Arg Cys Val Arg Ala Lys
        615                 620                 625

ata aac gtt gct atg att tgt cag acc ttg gtg agc ccc cca gag gga     2034
Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser Pro Pro Glu Gly
    630                 635                 640

aac cag gag att agc agg gac aac att cta tgc aag att aca tac gtg     2082
Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val
645                 650                 655                 660

gcc aat gta aac cct gga gga tgg gcc cca gcc tca gtg tta cgg gca     2130
Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser Val Leu Arg Ala
                665                 670                 675

gtg gca aag cga gaa tat cca aag ttt cta aag cgt ttt act tct tac     2178
Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr
            680                 685                 690

gta caa gaa aaa act gca gga aaa cct att ttg ttc tag tattaacagt     2227
Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
        695                 700

gactgaagca aggctgtgtg acattccatg ttggaggaaa aaaaaaaaaa aaaaaa      2283


<210>  100
<211>  704
<212>  PRT
<213>  Bos taurus

<400>  100

Leu Ala Ser Arg Gly Pro Asn Ser Gly Gly Gly Ala Gly Arg Ser Ala
1               5                   10                  15


Gly Val Thr Thr Thr Ala Thr Ala Asp Gly Trp Lys Gly Arg Leu Pro
            20                  25                  30


Ser Pro Leu Asp Leu Leu Pro Arg Ser Ala Trp Cys Gln Ala Arg Arg
        35                  40                  45


Arg Arg Arg Arg Arg Arg Gly Gly Arg Thr Pro Ser Leu Leu Pro Leu
    50                  55                  60


Pro Pro Ala Pro Glu Arg Ala Leu Leu Pro Ser Pro Ser Pro Asp Pro
65                  70                  75                  80


Ser Pro Arg Gly Leu Gly Ala Ser Thr Gly Ala Ala Gln Gly Ala Gly
                85                  90                  95


Ala Gly Leu Leu Leu Gly Cys Arg Ala Ser Met Ser Asp Asn Gln Ser
            100                 105                 110
```

```
Trp Asn Ser Ser Gly Ser Glu Glu Asp Pro Glu Thr Glu Ser Gly Pro
        115                 120                 125

Pro Val Glu Arg Cys Gly Val Leu Ser Lys Trp Thr Asn Tyr Ile His
    130                 135                 140

Gly Trp Gln Asp Arg Trp Val Val Leu Lys Asn Asn Thr Leu Ser Tyr
145                 150                 155                 160

Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly Cys Arg Gly Ser Ile Cys
                165                 170                 175

Leu Ser Lys Ala Val Ile Thr Pro His Asp Phe Asp Glu Cys Arg Phe
            180                 185                 190

Asp Ile Ser Val Asn Asp Ser Val Trp Tyr Leu Arg Ala Gln Asp Pro
        195                 200                 205

Asp His Arg Gln Gln Trp Ile Asp Ala Ile Glu Gln His Lys Thr Glu
    210                 215                 220

Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg Arg His Gly Ser Met Val
225                 230                 235                 240

Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser Ala Thr Ser Thr Ser Ser
                245                 250                 255

Phe Lys Lys Gly His Ser Leu Arg Glu Lys Leu Ala Glu Met Glu Thr
            260                 265                 270

Phe Arg Asp Ile Leu Cys Arg Gln Val Asp Thr Leu Gln Lys Phe Phe
        275                 280                 285

Asp Ala Cys Ala Asp Ala Val Ser Lys Asp Glu Phe Gln Arg Asp Lys
    290                 295                 300

Val Val Glu Asp Asp Glu Asp Asp Phe Pro Thr Thr Arg Ser Asp Gly
305                 310                 315                 320

Asp Phe Leu His Asn Thr Asn Gly Asn Lys Glu Lys Val Phe Pro His
                325                 330                 335

Val Thr Pro Lys Gly Ile Asn Gly Ile Asp Phe Lys Gly Glu Ala Ile
            340                 345                 350

Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu Ala Thr Leu Ser His Cys
        355                 360                 365
```

```
Ile Glu Leu Met Val Lys Arg Glu Asp Ser Trp Gln Lys Arg Met Asp
    370                 375                 380

Lys Glu Thr Glu Lys Arg Arg Arg Val Glu Glu Ala Tyr Lys Asn Ala
385                 390                 395                 400

Met Thr Glu Leu Lys Lys Lys Ser His Phe Gly Gly Pro Asp Tyr Glu
                405                 410                 415

Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu Glu Phe Phe Asp Ala Val
            420                 425                 430

Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile Glu Glu Gln Ser Gln Ser
        435                 440                 445

Glu Lys Val Arg Leu His Trp Ser Thr Ser Met Pro Ser Gly Asp Ala
    450                 455                 460

Phe Ser Ser Val Gly Thr His Arg Phe Val Gln Lys Val Glu Glu Met
465                 470                 475                 480

Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala
                485                 490                 495

Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg
            500                 505                 510

Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His
        515                 520                 525

Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn
    530                 535                 540

Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val
545                 550                 555                 560

Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys
                565                 570                 575

Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Ala Ile
            580                 585                 590

Arg Lys Ile Pro Ala Leu Asn Glu Asn Asp Pro Glu Thr Trp Ile Val
        595                 600                 605

Cys Asn Phe Ser Val Asp His Ser Ser Ala Pro Leu Asn Asn Arg Cys
```

610 615 620

Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser
625 630 635 640

Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys
645 650 655

Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser
660 665 670

Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg
675 680 685

Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
690 695 700

<210> 101
<211> 13
<212> PRT
<213> Mus musculus

<400> 101

Gly Ala Gly Ala Gly Leu Leu Leu Gly Arg Cys Val Ser
1 5 10

<210> 102
<211> 171
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 102

Met Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu
1 5 10 15

Ala Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg
20 25 30

His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly
35 40 45

Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys Asp Ser His His Pro
50 55 60

Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser His Gly Arg
65 70 75 80

Thr Gln Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr
85 90 95

Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly Arg Gly Leu Ser Leu
100 105 110

Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly Tyr
115 120 125

Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly
130 135 140

Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg
145 150 155 160

Asp Ser Arg Ser Gly Ser Pro Met Ala Arg Arg
165 170

<210> 103
<211> 18
<212> PRT
<213> artificial

<220>
<223> Derived sequence

<400> 103

Pro Arg Ser Ala Arg Cys Gln Ala Arg Arg Arg Arg Gly Gly Arg Thr
1 5 10 15

Ser Ser